FAO Fisheries Circular No. 941 FIRM/C941
ISSN 0429-9329

LIBRARY
MAROS
National Marine Fisheries Service
2570 Dole Street
Honolulu, Hawaii

REVIEW OF INTERNET WEBSITES FOR THE SMALL PELAGIC FISH SPECIES: SARDINES AND ANCHOVIES

INTERNATIONAL YEAR OF THE OCEAN 98

Food and Agriculture Organization of the United Nations

LIBRARY

MAR 05

National Marine Fisheries Service
2570 Dole Street
Honolulu, Hawaii

REVIEW OF INTERNET WEBSITES FOR THE SMALL PELAGIC FISH SPECIES: SARDINES AND ANCHOVIES

by

Dr. Dale Kiefer
Professor of Biological Sciences
University of Southern California

and

William D. Grafton III
Research Assistant
University of Southern California

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Rome, December 1998

PREPARATION OF THIS DOCUMENT

This document was prepared at the request of the Marine Resources Service, Fishery Resources Division in the FAO Fisheries Department. The review was completed in June 1998. The quantity of information disseminated over the Internet has grown explosively over the past several years. There is currently a substantial amount of regularly updated information potentially applicable to fisheries issues, but guidelines and precedents for its acquisition and application are generally lacking at the present time. Preparation of this document was supported by the Japanese Government under "Kyoto Follow-up" project "GCP/INT/643/JPN - Sustainable Contribution of Fisheries to Food Security II". It is regarded as being a background document for the assembly of an informative set of case histories of application of satellite and other routinely gathered data, available on the World Wide Web, to problems related to small pelagic fisheries. This is hoped eventually to lead to an experts consultation and publication of a much more extensive volume of experiences and recommended procedures. However, in order to promote this eventual result, and in view of the timeliness of the material, it was decided to publish and distribute the present document immediately as an FAO Fisheries Circular.

Kiefer, D.; Grafton, W.D., III
Review of Internet websites for the small pelagic fish species: sardines and anchovies.
FAO Fisheries Circular. No. 941 . Rome, FAO. 1998. 72p.

ABSTRACT

This report provides a list and evaluation of sites on the World Wide Web that contain information potentially relevant to management or operations of small pelagic fisheries. The majority of the sites listed provide information that directly concerns the biology, ecology, and fisheries of small pelagic fishes such as anchovies and sardines (pilchards). Other sites evaluated provide information on climatic and oceanographic processes that are thought to effect the population dynamics of these fishes. The document lists and evaluates over 100 Internet web sites and is the product of about 300 hours of "surfing" the Web.

The FAO Fisheries Circular is a vehicle for distribution of short or ephemeral notes, lists, etc., including provisional versions of documents to be issued later in other series.

CONTENTS

	Page
INTRODUCTION	1
TIPS TO SURFING	2
ORGANIZATION OF LISTINGS	3
CHAPTER 1 - TOP WEBSITES	6
CHAPTER 2 - OCEANIC REGIONS	9
SECTION A - North Pacific Ocean	9
SECTION B - South Pacific Ocean	27
SECTION C - North Atlantic Ocean	31
SECTION D - South Atlantic Ocean	34
SECTION E - Indian Ocean	38
CHAPTER 3 - FISH SPECIES LISTINGS	41
CHAPTER 4 - INDUSTRY	45
CHAPTER 5 - PUBLICATIONS	49
CHAPTER 6 - FISHERIES STATUS	56
CHAPTER 7 - CLIMATIC AND OCEANOGRAPHIC PROCESSES	60

Digitized by the Internet Archive
in 2025

https://archive.org/details/fao-fisheries-and-aquaculture-circular_1998-12_941

INTRODUCTION

This report is a list and evaluation of sites on the World Wide Web that contain information on small pelagics and the associated fisheries. The majority of the sites listed below provide information that directly concerns the biology, ecology, and fisheries of the anchovy, sardine (pilchard), etc. Other sites listed below provide information on climatic and oceanographic processes that are thought to effect the population dynamics of these taxa.

Although the name small pelagics implies a more comprehensive category of all species of pelagic fish that are small, the category is most commonly applied to the species found in the two families, the Engraulididae and Clupeidae; these species are grouped under the common names of sardine, pilchard, anchovy, and herring. As stated above our survey of websites includes the sardine, anchovy, and similar small pelagics. These taxa share several common characteristics; all are planktivorous, form schools, grow rapidly, and are short lived, and their populations vary greatly with time (Csirke, 1988).

Populations of anchovy and sardine are found throughout the world's temperate and tropical waters, and they are most important in meso and eutrophic coastal waters. Because of both the high levels of primary production in their habitat and their position as herbivores and primary carnivores within the marine food chain, one might expect the sardines and anchovies to achieve large standing stocks. This expectation is realized most dramatically at many geographic locations such as the upwelling system of the Humboldt, California, Canary, and Benguela currents and the strong frontal system of the Kuroshio current. Because of both their extraordinary biomass in these and other locations and their proximity to shore, these groups are major contributors to the annual mass catch. Specifically, the small pelagics commonly contribute between 30-40% of the global catch (Csirke, 1995). Because much of this catch is converted into fish meal, the economic value of these fisheries is considerably smaller.

The highly productive waters in which these fish are found are characterized by unstable oceanographic features such as upwelling circulation or river plumes. These features are sensitive to meteorological and climatic conditions, and thus the habitat of the sardine and anchovy is both complex and variable. The advantages and disadvantages of living in such a habitat have been examined by Bakun (1996). The size of individual species populations vary dramatically with time and recent analysis of time series of both commercial catch and sedimentary records of fish scales and otoliths suggest that continual oscillations of population size are typical of these species (Kawasaki, 1983; Baumgartner, Soutar, and Ferreira-Bartrina, 1992).

The temporal variability of small pelagics stocks and the likelihood that the size of stocks are very sensitive to environmental conditions posses a major challenge to successful management of these fisheries. It is very likely that improved management of the small pelagics fisheries will require the gathering and analysis of more information than is presently being done. Hopefully, our report on information available on the World Wide Web is a first step in this direction. The list that we have compiled, consists of over 100 sites and is the product of about 300 hours of "surfing" the Web. Before presenting this list, we think that it would be useful to provide a few elementary tips about searching on the WEB.

TIPS TO SURFING

Although the World Wide Web has the potential to be a powerful research tool, its seemingly limitless storage and presentation capacity in fact poses an immediate obstacle to its effective use. We have found that the reference, *The Internet for Dummies* by Levine, Young, and Reinhold is very helpful in overcoming some of these problems. How does one find the material of interest in this disorganized "electronic leviathan"? The answer to this question lies in the use of search engines that are cleverly designed and fully integrated into the browser. Although Internet software such as Netscape or Internet Explorer will include a default search engine, there are several from which to choose, and the most popular engines are listed below. During the course of our work, we were most impressed with Inference.

1. **Alta Vista:** **http://www.altavista.digital.com/**
2. **Inference:** **http://infind.inference.com/infind/infind.exe**
3. **InfoSeek:** **http://www.infoseek.com/**
4. **Yahoo:** **http://www.yahoo.com/**

In general, most search engines are very easy to use, and if help is needed we recommend visiting the Windweaver Search Tools page, which provides very good information about some of the search engines and research tools: **http://www.windweaver.com/searchtools.htm.** By simply entering in a "search string" pertaining to topics of interest and clicking on a search button or icon, a list of finds is presented. However, sometimes the search string is too vague or broad resulting in a lengthy list often containing many irrelevant addresses. There are of course simple methods to narrow the results. One may choose search strings which are more specific. For example, one might choose to search for *Sardinops sagax* in place of sardine. A section of this report provides an array of specific fish species names pertaining to sardines and anchovies. One may also combine search string words with Boolean operators such as "AND" or "OR". It should be noted that browsers may utilize a different set of Boolean operators. For example, one engine might use "AND", while another might use "+" to obtain a similar result. In addition, many search engines some provide the opportunity to set a variety of parameters. Some of these parameters include advanced searches, time limits on the search and language, i.e. Spanish or English.

With regard to the browser, in some cases, the researcher may have a legitimate website address line but cannot access the website. Try removing small pieces of the website address between backslashes " / ". This may provide a segment of the address which is accessible. Additionally, a drop down arrow may provide access to recently visited websites. The browser also may provide a tool referred to here as the "find button". On Netscape, it is found under the Edit drop down menu in the tool bars menu. This tool provides a valuable search device. An example of the merits of this tool was our uncovery of over 100 references at the URL of the United States Food and Drug Administration where there exists "market names of fish": **http://vm.cfsan.fda.gov/~ear/seafood.html**. To find the references to anchovies, sardines and pilchards on this website address,***use the find button; enter*** **(anchovy;** ***result*****= 60 matches)/*****then try*** **(pilchard;** ***result*****=21 matches)/*****then try*** **(sardine;** ***result*****=20 matches)**. Typically, this tool allows the researcher to set the search to go down or up the page and locate matches on the active website page displayed on the monitor screen one at a time. Each match will be highlighted on the monitor.

ORGANIZATION OF LISTINGS

As indicated below the list of sites are organized into 7 chapters which are self explanatory.

Chapter 1 **TOP WEBSITES**
These sites are exceptionally comprehensive, detailed, and well organized.

Chapter 2 **OCEANIC REGIONS**
These sites have a geographic focus and are classified according to the following five oceanic regions

Section A. **North Pacific Ocean**
The eastern coastal boundary of this region extends from Costa Rica to Alaska and the western coastal boundary extends from Vietnam to the Soviet Union. The region includes the Kuroshio and California currents.

Section B. **South Pacific Ocean**
The eastern coastal boundary of this region extends from Panama to Chile and the western coastal boundaries includes the coast of New Zealand. The region includes the Humboldt and the East Australian currents.

Section C. **North Atlantic Ocean**
The eastern coastal boundary of this region extend from the Iberian Peninsula to England and the western coastal boundaries extend from Florida to Canada. The region includes the Canary and the Gulf Stream currents.

Section D. **South Atlantic Ocean**
The eastern coastal boundary of this region extends from Gabon to South Africa and the western coastal boundaries extends from Brazil to Argentina. The region includes the Benguela and Brazil currents.

Section E. **Indian Ocean**
The eastern coastal boundary of this region is western coast of Australia and the western coastal boundary is the coast of Africa. The region includes the Agulhas and the West Australian currents.

Chapter 3 **Fish Species Listings**
These sites provide species information, and some of these sites provide extensive and detailed biological information. These sites are a good resource for further Internet research by providing species names. Many of the sites are in languages other than English.

Chapter 4 **Industry**
These sites focus on the operation of fisheries. The sites provide information that is not exclusively related to the small pelagics.

Chapter 5 **Publications**
These sites are built around publications, and some provide valuable search engines for finding publications. Certain sites provide abstracts while others present a single publication.

Chapter 6 **Fisheries Status**
These sites provide material pertaining to the state of fisheries in general with some reference to sardines, anchovy and pilchard fisheries. In conjunction with the previous websites, these sites may be useful for further Internet research.

Chapter 7 CLIMATIC AND OCEANOGRAPHIC PROCESSES

These sites provide provide information on the oceanographic conditions in regions where the small pelagics are found. Additionally, these sites address potential impacts of climate change on fisheries and ocean processes. These sites do not necessarily contain material specifically related to sardines, anchovies and pilchards; but in conjunction with the sites found in the other chapters, they are useful for further Internet research.

Each listing of a website within a chapter will contain a URL address. In most cases each website is listed only once; occasionally however, a website will be listed in more than once if it provides a good link between chapters. Each listing also contains a general descriptio of the site as well as a tabular evaluation of the content of the site. A goal of this report is to efficiently direct those interested in small pelagics to sites that meet their specific needs, and the evaluation table provides a quick reference guide. The evaluation contains the 9 parameters that follow.

1. Biology-including the anatomy, natural history, ecology, and taxonomy
2. Oceanography-including Ekman transport, currents, halocline, retention, general geographic location, and coastlines
3. Climate-including decadal variability, El Nino/ENSO, and temperature
4. Industry-including investment in fishing, catch value (before and after processing), catchweight and species
5. Research/Data-including current research, datasets, time series information, and other types of historical records
6. Publications-including journals, papers, reports and literary works
7. Links-including internal(through the website) and external (through the web)
8. Images-including charts, tables, schematics and photo or drawn images
9. Contacts-including phone numbers and street or e-mail address

Each of these parameters is scored on a star system. Three stars is the highest score and indicates excellent content and organization, two stars is considered very good, and one star is considered good. If a parameter lacks stars, either the site does not contain information of that type or the information that is provided is of little interest. All of the sites listed in this report contain some useful information. Sites that contain information on sardine, pilchard, and anchovy may not be listed in this report for either of 3 reasons:

they were missed in our search
they are new sites created since the completion of this report
they were not considered by us to be of interest

The first two reasons for absence are the most likely explanation. One should keep inmind that one's impression of a site may be determined by the power of one's computer. Sites that contain much graphical and pictorial information require additional time to download, and with slower computers these delays may be considered objectionable.

Finally, the Internet provides a mammoth and poorly organized resource of information and communication. In general is is almost impossible to find all relevant

material. A recent survey of the Web has shown that even the most advanced search engines find only about 1/3 of the hundreds of millions of sites. To make matters worse, listings continue to grow exponentially. After completing the survey, we were left with the impression that Web information on the small pelagics is broad but not deep. It value to the expert appears to be largely as a source of databases, a source of up-dated information on oceanographic, fishery, and meteorological conditions, and a source of information on one's professional activities including announcements of research initiatives, meetings, and personal contacts. The information is however not deep enough to take the expert to new and unexpected sources of detailed information. For the non-expert the Webs listed below are a very rapid and efficient means of learning about the issues and activities associated with the small pelagics.

References

T. R. Baumgartner, A. Soutar, and V. Ferreira-Bartrina. 1992. Reconstuction of the past history of Pacific sardine and northern anchovy populations over the past two millenia from sediments of the Santa Barbara Basin, California. CalCOFI, 33: 24-40.

A. Bakun. 1996. Patterns in the Ocean: Ocean Processes and Marine Population Dynamics. University of California, Sea Grant, La Paz, Baja California Sur, Mexico, 322 pp.

J. Csirke. 1988. Small shoaling pelagic fish stocks, chapter 11, 271-301, in *Fish Population Dynamics* (Second Edition), edited by J.A. Gulland, John Wiley & Sons.

J. Csirke. 1995. Fluctuations in abundance of small and mid-sized pelagics, Scientia Marina 59, 3-4: 481-492

****

TOP WEBSITES

These two sites are exceptionally comprehensive, detailed, and well organized.

****

SPECIES IDENTIFICATION AND DATA PROGRAMME (SIDP)

WEBSITE ADDRESS(ES):

http://www.fao.org/Waicent/FAOINOF/FISHERY/sidp/htmls/frstmap.html

WEBSITE CONTENT EVALUATION:

* * *	Biology	* * *	Oceanography	* *	Climate
* * *	Industry	*	Research/Data	* * *	Publications
* * *	Links	* * *	Images	* * *	Contacts

WEBSITE OVERVIEW:

The Species Identification and Data Programme (SIDP) website is an exceptionally good source of information regarding fisheries in general; at the same time it provides comprehensive coverage regarding specific fish species and FAO fisheries areas. In particular, nine separate species of sardines, anchovies and pilchards (Pacific anchoveta, Southern African anchovy, European anchovy, Peruvian anchovy, European sardine, Round sardinella, Goldstripe sardinella, California pilchard and South American pilchard) are covered in great detail. A series of links provide the user the opportunity to delve into greater detailed searches within the website.

One link takes one to an interactive world map which is divided into Food and Agriculture Organization (FAO) fisheries; this part of the website provides a geographic approach to further searches. By clicking on any one of these FAO fisheries areas, a new screen appears listing SIDP publications, species of major importance, major fishing countries and state of the world fishery resources. A similar set of options can be obtained by clicking on the list of FAO fishing areas and then selecting the fishing area of interest from the interactive text options. SIDP publications, species of major importance and major fishing countries can be searched relative to the fishing area through the path provided by the world map search or the listing of FAO fishing areas. Worth noting is the very detailed information provided by the state of the world fishery resources. This path provides narrative and visual images about the selected FAO fishing area as well as numerous fish species within the selected fishing area surpassing the list of species of major importance. This particular path has very good information concerning the selected fishing area regarding:

*geographical details-(in text as well as a map link)
*climatic conditions
*environmental conditions
*profile of catches- (in text as well as several graphic links)
*resource and management status

A second link takes one to individual species. By clicking on the list of species, an interactive listing of species of major importance to fisheries provides a path to advanced information pertaining to the individual fish species selected, i.e. Southern African anchovy *(Engraulis capensis)*. This path includes an image of the selected species, description of the habitat, geographic boundaries and biology, a color-coded world map depicting the range of the species, description of the importance of each species to the fishing industry, longitudinal graphs of catches, and literature resources for further research on the species.

A third link, which downloads SIDP publications, leads to a series of four options: species ID sheet, field guides, species catalogues and species synopses. Under the species catalogues items, selecting the Clupeoid fishes of the world option will provide an abstract of a volume concerning the suborder Clupeoidei (including sardines, anchovies and pilchards), the cost and how to purchase the volume. A fourth link is provided for easy purchase. Finally in regards to contacts, the website includes three e-mail addresses linked for easy access. In sum, the SIDP website contains numerous information and supportive links concerning sardines, anchovies and pilchards. Additionally, it is very well organized, easy to utilize and aesthetically well formated.

RELATED WEBSITE ADDRESS(ES):
http://www.fao.org/Waicent/FAOINOF/FISHERY/fishery.htm

RELATED WEBSITE OVERVIEW:
This page is directly accessible by entering it into the web address line. FAO FISHERIES HOME PAGE-This website incudes information concerning, management, general fishery information, resources, legal and cooperative bodies.

~~~~~~

FISHERIES WESTERN AUSTRALIA

WEBSITE ADDRESS(ES):
INDEX (Fisheries Western Australia)
http://www.wa.gov.au/gov/westfish/index.html
***select* (Commercial Fishing)**
http://www.wa.gov.au/gov/westfish/comm/index.html
***select* (Commercial Fishing of WA)**
http://www.wa.gov.au/gov/westfish/comm/index.html#commfish
***select* (Pilchards & Anchovys)**
http://www.wa.gov.au/gov/westfish/comm/broc/pilcm.html
***return to* (Commercial Fishing of WA)**
http://www.wa.gov.au/gov/westfish/comm/index.html#commfish
***select* (El Nino & The Leeuwin Current)**
http://www.wa.gov.au/gov/westfish/comm/bro/elnino/index.html
***return to* (Commercial Fishing of WA)**
~~~~~~

http://www.wa.gov.au/gov/westfish/comm/index.html#commfish
***select* (Catch & Effort Statistics)**
http://www.wa.gov.au/gov/westfish/comm/broc/stats/index.html
***select* (1994/95; Fish)**
http://www.wa.gov.au/gov/westfish/comm/broc/stats/9594/9594A.html
***return to* (Catch & Effort Statistics)**
http://www.wa.gov.au/gov/westfish/comm/broc/stats/index.html
***select* (1995/96; Fish)**
http://www.wa.gov.au/gov/westfish/comm/broc/stats/9695/9695A.html

WEBSITE CONTENT EVALUATION:

* *	Biology	* *	Oceanography	*	Climate
* * *	Industry	*	Research/Data		Publications
* * *	Links	* * *	Images		Contacts

WEBSITE OVERVIEW:

The Commercial Fishing in Western Australia website is an exceptionally well designed resource for obtaining information to a host of marine species important to the Western Australian fishing industry. This page is designed with easy to follow internal links. See list above for those links which pertain most to pilchard and anchovy research. Additionally, the pages include multi-colored maps and images such as graphs, charts and drawings of certain species. This page is very weighted with images and may take extra time to download; yet the images are exceptional.

In the pages titled Pilchards & Anchovy, information pertaining to the pilchard and anchovy fisheries, biology, specific fisheries, i.e. Esperance and Bremer Bay fishery, markets and management, research, environmental status and a useful glossary provide a very comprehensive overview of the Western Australia (WA) fisheries. Additionally, there are two multi-colored maps, one depicting the pilchard and anchovy distribution for easy geographic identification; the other depicting the pilchard and anchovy fisheries in WA. These pages concisely summarize the pilchard and anchovy fisheries in WA.

The pages titled El Nino And The Leeuwin Current, are a brief synopsis of the impacts of El Nino on the major current in this region provides insight to the interconnected effects on the fisheries of the WA. Very good descriptive detail regarding the current and El Nino illuminate the interconnections. Additionally, this section includes a multi-colored satelitte photo for spatial comparison.

The pages titled Catch & Effort Statistics depict landed and live weight catches for anchovy and pilchard in Kgs for each fishing season. In sum, these pages provide comprehensive information about the WA pilchard and anchovy fisheries. The exceptional usage of maps, satelitte imagery, and charts help to provide a snapshot of the region's fisheries with good detail.

~~~~~~
~~~~~~

-CHAPTER 2-

****

OCEANIC REGIONS

These sites have a geographic focus and are classified according to the following five oceanic regions.

****

-CHAPTER 2, SECTION A-

****

OCEANIC REGION: North Pacific Ocean

The eastern coastal boundary of this region extends from Costa Rica to Alaska and the western coastal boundary extends from Vietnam to the Soviet Union. The region includes the Kuroshio and California currents.

****

THE CALIFORNIA SARDINE INDUSTRY

WEBSITE ADDRESS(ES):

http://gurukul.ucc.american.edu/ted/Sardine.HTM

WEBSITE CONTENT EVALUATION:

*	Biology	* *	Oceanography	*	Climate
* * *	Industry	*	Research/Data	* *	Publications
*	Links		Images		Contacts

WEBSITE OVERVIEW:

This website is directly accessible by entering it into the web address line. It provides detailed information regarding the California Sardine Industry. The data provided focuses on the industry, i.e. historical and current catches as well as oceanography. The website is approximately nine pages long. Additonally, it includes internal links to similar cases provided by the TED (Trade and Environment Database) Projects.

RELATED WEBSITE ADDRESS(ES):

http://gurukul.ucc.american.edu/ted/SUPER.HTM

RELATED WEBSITE OVERVIEW:

This page is directly accessible by entering it into the web address line. The TED Super Page provides a resource to navigate around the Trade and Environment Database (TED) Home Page. It includes internal links to other TED projects and cases similiar to the one highlighted above.

~~~~~~
~~~~~~

NOAA FISHERIES HEADQUARTERS

U.S. TRADE IN FISHERY PRODUCTS, CURRENT MONTH
BY PRODUCT

WEBSITE ADDRESS(ES):

NOAA Fisheries Heaquaters (Index)
http://kingfish.ssp.nmfs.gov/
select **(Latest Catch Information Statistics)**
http://remora.ssp.nmfs.gov/trade/trade_cmprsn_prdct_allcntrys
select parameters **(Trade Type [imports or exports]; products [anchovy or sardine])**

WEBSITE CONTENT EVALUATION:

	Biology		Oceanography	Climate
* * *	Industry	*	Research/Data	Publications
* *	Links		Images	Contacts

WEBSITE OVERVIEW:

This website is directly accessible by entering it into the web address line. Following the suggestions above yields good comparative commercial data regarding imports/exports and sardines/anchovies across selected countries in context to the United States of America. The data is presented in kilos and value (in Amercian dollars) for the current month and the YTD. This is a wide page based upon "layout" format; it is possible to scroll to the right from the point of origin for more data.

~~~~~~

UNIT 14 PACIFIC COAST AND ALASKA PELAGIC FISHERIES

WEBSITE ADDRESS(ES):

NOAA Fisheries Heaquaters (Index)
http://www.nmfs.gov/
select **(NMFS Publications-Reports & Images)**
http://www.nmfs.gov/nmfspubs.html
select **(Our Living Oceans Annual Report)**
http://www.nmfs.gov//olo.html
select **(Pacific Coast and Alaska Pelagic Fisheries)**
http://www.nmfs.gov/olo/unit14.html
~~~~~~

WEBSITE CONTENT EVALUATION:

*	Biology	Oceanography	Climate
* *	Industry	Research/Data	Publications
* *	Links	Images	Contacts

WEBSITE OVERVIEW:

This page is directly accessible by entering it into the web address line or by following the navigation paths above. It provides information pertaining to the economic importance, status and stock management of the Northern Anchovy and Pacific Sardine as well as several other small pelagic fishes found off the Pacific Coast. It provides good insight into decision making regarding catch quantities and fishery closures, citing historical cases, as well as current status. Internal links aid in navigation.

RELATED WEBSITE ADDRESS(ES):

return to **(Our Living Oceans Annual Report**
http://www.nmfs.gov/olo.html
select **(Nearshore Fisheries)**
http://www.nmfs.gov/olo/unit21.html

RELATED WEBSITE OVERVIEW:

This page is accessible by following the navigation paths described above. Unit 21 Nearshore Fisheries provides information on nearshore fisheries and mentions sardines.

~~~~~~

NOAA FISHERIES TECHNICAL REPORTS

WEBSITE ADDRESS(ES):

return to **(NMFS Publications-Reports & Images)**
http://www.nmfs.gov/nmfspubs.html
select **(Technical Reports)**
(Search Engine)
http://noc.nwn.noaa.gov/404.html
enter **([sardine anchovy];** ***result*****=three matches)**
(Untitled)
http://research.nwfsc.noaa.gov/pubs/tm/tm28/appg.htm
(Untitled)
http://research.nwfsc.noaa.gov/pubs/tm/tm28/appf.htm
(NOAA/OGP/UCAR El Nino and Climate Prediction)
http://www.pmel.noaa.gov/toga-tao/el-nino-report.html
~~~~~~

WEBSITE CONTENT EVALUATION:

	Biology	Oceanography	Climate
	Industry	* * * Research/Data	Publications
* *	Links	Images	Contacts

WEBSITE OVERVIEW:

These pages are accessible by following the navigation paths described above. Select the first two search string results to access a lengthy table of the results of studies of the food habit of pinnipeds of the Pacific Coast. (including small pelagic fish species such as sardines and anchovies). Additionally, the extensive list of common, genus and species names of pinniped prey species includes sardine and anchovy. Additional information provides a brief description of El Nino impacts on South Pacific anchovy and sardines fisheries.

~~~~~~

FISHERY MANAGEMENT COUNCIL PAGES

WEBSITE ADDRESS(ES):

NOAA Fisheries Heaquaters (Index)
http://www.nmfs.gov/
***select* (Fishery Management Council Pages)**
http://www.noaa.gov/nmfs/councils.html
***select* (Pacific Fishery Management Council)**
http://www.pcouncil.org/
***select* (Coastal Pelagic)**

WEBSITE CONTENT EVALUATION:

*	Biology	Oceanography	Climate
* *	Industry	Research/Data	Publications
* *	Links	Images	Contacts

WEBSITE OVERVIEW:

This page is accessible by following the navigation paths described above.The site provides information about the small pelagics fishery including uses as well as fishery management plans. Good internal links aid in navigation to related pages within the home page.

~~~~~~

STATISTICS ON THE AGRIGULTURE, FORESTRY AND FISHERIES OF JAPAN

WEBSITE ADDRESS(ES):

(Index)
http://www.maff.go.jp/abst/abindex.html
***scroll to* (11 Fisheries); *select* (11-Fisheries)**
***select* (3 Fishery product; b By major fish species)**
http://www.maff.go.jp/abst/form1/11ab/49b.html

WEBSITE CONTENT EVALUATION:

	Biology	Oceanography	Climate
* * *	Industry	Research/Data	Publications
*	Links	Images	Contacts

WEBSITE OVERVIEW:

This website is directly accessible by entering it into the web address line or following the navigation path described above. Follow the navigation path described above to locate a 25-year table of catches of major fish species including sardine and anchovy for Japan. The page provides good internal links for easy navigation to related pages within the home page.

~~~~~~

SCRIPPS INSTITUTION OF OCEANOGRAPHY RESEARCH ACTIVITES LIST

WEBSITE ADDRESS(ES):

(Search engine)
http://scilib.ucsd.edu/sio/indexes/siorsrch.html
***enter* (Sardine; *result*= 4 citings)**
***select* (Butler, John)**

***return to* (Search string results)**
***select* (Schwartzlose, Richard A.)**

***return to* (Search string results)**
***select* (Smith, Paul E)**

***return to* (Search string results)**
***select* (Baumgartner, Tim R)**

***return to* (Search Engine)**
***enter* (Anchovy; *result*= 3 citings)**
follow same format as for sardine example
***enter* (Small Pelagic; *result*= 21 citings)**
~~~~~~

follow same format as for sardine example
alternatively select **(Research activites list.; 111 pages)**
http://scilib.ucsd.edu/sio/indexes/siorsr-z.html
use find button;
enter **(sardine;** ***result*=5 citings)**
enter **(anchovy;** ***result*=4 citings)**
enter **(pelagic;** ***result*=18 citings)**

WEBSITE CONTENT EVALUATION:

	Biology		Oceanography		Climate
	Industry	* * *	Research/Data	* * *	Publications
	Links		Images		Contacts

WEBSITE OVERVIEW:

These websites are accessible by following the navigation paths described above. The Research Activites List is 111 pages long and provides a large selection of general resources. However, by following the navigation paths described above, a search is of course narrowed.

~~~~~~

NORTHERN ANCHOVY

WEBSITE ADDRESS:

http://www.psmfc.org/habitat/edu_anchovy_fact.html

WEBSITE CONTENT EVALUATION:

*	Biology	*	Oceanography		Climate
*	Industry	*	Research/Data		Publications
* *	Links		Images		Contacts

WEBSITE OVERVIEW:

This website is directly accessible by entering it into the web address line. It is a brief page but provides a good summary of biology, habitat, and economic value of the Northern Anchovy *(Engraulis mordax)*. It also includes links to related websites within the home page dealing with fisheries in general and other fish species.

~~~~~~

NORTHERN ANCHOVY-ENGRAULIS MORDAX (GIRARD)

WEBSITE ADDRESS(ES):

http://elib.cs.berkeley.edu/kopec/tr9/html/home.html
***select* (Species sorted by Common Name**
http://elib.cs.berkeley.edu/kopec/tr9/html/species-common-name-list.html
***select* (Northern Anchovy)**
http://elib.cs.berkeley.edu/kopec/tr9/html/sp-northern-anchovy.html

WEBSITE CONTENT EVALUATION:

* * *	Biology	* * *	Oceanography		Climate
*	Industry	* * *	Research/Data	*	Publications
*	Links	* *	Images		Contacts

WEBSITE OVERVIEW:

This page is directly accessible by entering it into the web address line or by following the navigation path described above. This website is part of the Berkeley Digital Library Project; it provides very good detail regarding spawning, eggs, larvae and juveniles of the Northern Anchovy. A narrative on the life history of the Northern Anchovy provides useful data. Additonally, the website includes links to images depicting early phases of life history as well as research on the life cycle.

RELATED WEBSITE ADDRESS(ES):

(Fishes of the Sacramento-San Joaquin Estuary and Adjacent Waters, California: A Guide to the Early Life Histories)
http://elib.cs.berkeley.edu/kopec/tr9/html/home.html

RELATED WEBSITE OVERVIEW:

This page is directly accessible by entering it into the web address line. It incudes information concerning taxonomic and ecological information on the eggs, larvae, and juveniles of 125 species of fish found in the Sacramento-San Joaquin estuary and nearby waters.

~~~~~~

U.S. DOMESTIC EXPORTS AND IMPORTS:

WEBSITE ADDRESS(ES):

(Index)
http://www.ita.doc.gov/industry/otea/Trade-Detail/Latest-Month/Exports/16/index.html
***select* (160413-Sardines)**
http://www.ita.doc.gov/industry/otea/Trade-Detail/Latest-Month/Imports/16/160413.html
[*result*=Import tables for Latest Month & YTD: 1604.13.1000; 604.13.2000; 1604.13.3000; 1604.13.4000; 1604.13.9000]
~~~~~~

select **(U.S. Exports)**
[*result*= Export table for Latest Month & YTD: 1604.13.0000]

return to **(Index)**
select **(160416-Anchovies)**
http://www.ita.doc.gov/industry/otea/Trade-Detail/Latest-Month/Exports/16/160416.html
[*result*=Export table for Latest Month & YTD: 1604.16.000]
select **(U.S. Imports)**
[*result*= Import tables for Latest Month & YTD: 1604.16.1000; 1604.16.3000; 1604.16.4000; 1604.16.6000]

WEBSITE CONTENT EVALUATION:

Biology	Oceanography	Climate
* * * Industry	Research/Data	Publications
* * Links	Images	Contacts

WEBSITE OVERVIEW:

These pages are accessible by following the navigation paths described above. Each page provides tables of imports or exports of sardines and anchovies in terms of quantity and value for the latest month and year to date (YTD). Global and national data are included. This page provides internal links for easy navigation throughout these pages.

~~~~~~

THE FISH LIST

WEBSITE ADDRESS(ES):

(Index)
http://id-www.ucsb.edu/lovelab/
select **(The Fish List)**
http://id-www.ucsb.edu/lovelab/list.html
select **(Clupeidae from fish family list)**
http://id-www.ucsb.edu/lovelab/l_long.html #Clupeidae

return **(to The Fish List)**
http://id-www.ucsb.edu/lovelab/list.html
select **(Engraulidae from fish family list)**
http://id-www.ucsb.edu/lovelab/l_long.html #Engraulidae
~~~~~~

WEBSITE CONTENT EVALUATION:

*	Biology	*	Oceanography		Climate
	Industry		Research/Data	*	Publications
* *	Links		Images		Contacts

WEBSITE OVERVIEW:

These websites are accessible by following the navigation paths described above. The pages provide access to a 79 page list of fishes classified to Order and Family. Follow the navigation paths described above or ***select*** **Scroll through the List and then use the find button: [*enter*-Clupeidae; *result*= Clupeidae Herrings or *enter*-Engraulidae; *result*= Engraulidae Anchovies]** to obtain a grouping of 5-8 fish species germaine to these two families. The information provided for each species is brief including habitat range and size. The internal links are very helpful in navigating this large page. Finally, an extensive bibliography is included at the end of the fish list page.

~~~~~~

VOLUSIA COUNTY FISH SURVEY SPECIES LIST

WEBSITE ADDRESS(ES):

(Fish Species List)
http://www.volusia.org/fisheries/spplist.htm
select **(Bay anchovy, *Anchoa mitchilli*)**
http://www.volusia.org/fisheries/amitch.htm

WEBSITE CONTENT EVALUATION:

	Biology		Oceanography		Climate
*	Industry	*	Research/Data		Publications
*	Links		Images		Contacts

WEBSITE OVERVIEW:

This website is directly accessible by entering it into the web address line. It provides a three page list of family and species of fishes collected during a fish survey around Volusia County. It includes several internal links including one to Bay Anchovy, *Anchoa mitchilli*, which provides more detailed data regarding size and occurrence during the survey.

~~~~~~

NEONET SEARCH ENGINE

WEBSITE ADDRESS(ES):

(Index)
http://www.neonet.nl/search/index.html
***use the* (Search Engine);*enter* (sardines + anchovies)**
***result*= three listing with 70%+ match**
***select* (California Wetfish Market Sample Data [CEOS IDN datasets])**
http://www.neonet.nl/ceos-idn/datasets/NMFS0026.html
***select* (California Sea Survey Data Files [CEOS IDN datasets])**
http://www.neonet.nl/ceos-idn/datasets/NMFS0027.html
***select* (Physical and Fauna Data from the California Cooperative Fisheries Oceanic Investigations in the Northeast Pacific (1951-1960) [CEOS IDN datasets])**
http://www.neonet.nl/providers/neonet.nlr.nl/local/cepos/datasets/FWA00128.html

WEBSITE CONTENT EVALUATION:

* *	Biology	* *	Oceanography		Climate
	Industry	* * *	Research/Data		Publications
* * *	Links		Images	* * *	Contacts

WEBSITE OVERVIEW:

These pages are accessible by following the navigation paths described above. The search engine provides access to a host of datasets. Follow the suggestions above to access the summaries of three datasets with 70%+ match to the search criteria (sardines + anchovies). Select each of these summaries to access more detailed information about each dataset including an abstract, contact information, and description of the data (medium and parameters). Additionally, interactive e-mail addresses are included for easy access to the contact and/or provider.

~~~~~~

SANTA MONICA BAY RESTORATION PROJECT HABITAT AND SPECIES

WEBSITE ADDRESS(ES):

(Habitat and Species)
http://www.smbay.org/eco/70.htm
***select* (Pelagic Habitat)**
http://www.smbay.org/eco/77.htm
***select* (Fishes)**
http://www.smbay.org/eco/79.htm
~~~~~~

WEBSITE CONTENT EVALUATION:

* Biology	* * Oceanography	* Climate
Industry	Research/Data	Publications
* * * Links	* * * Images	* Contacts

WEBSITE OVERVIEW:

These pages are accessible by following the navigation paths described above. These pages provide a small amount of information about fishes, including Pacific sardine and northern anchovy, and pelagic habitat of the Santa Monica Bay. The images and links are extremely good.

~~~~~~

FISHERIES RESEARCH-SMALL COASTAL PELAGIC FISHES

WEBSITE ADDRESS(ES):

(Fisheries Research)
http://swfsc.ucsd.edu/fish_res.html
***select* (SmallCoastal Pelagic Fishes)**
http://swfsc.ucsd.edu/sml_pel.html

WEBSITE CONTENT EVALUATION:

Biology	Oceanography	Climate
Industry	* Research/Data	Publications
* * Links	Images	Contacts

WEBSITE OVERVIEW:

This page is directly accessible by entering it into the web address line or by following the navigation path described above. This page briefly describes ongoing research concerning anchovy, sardine and mackerel in the Northern Pacific Ocean. Additionally, it includes interactive links to the La Jolla Laboratory's Coastal Fisheries Resource Division and California Cooperative Fisheries investigations (CalCOFI).

~~~~~~

GENETIC VARIABILITY IN FISH POPULATIONS

WEBSITE ADDRESS(ES):

(Table of Contents)
http://www.sdsc.edu/GatherScatter/newsletters.html

select **(Search the Gather/Scatter Collection)**
http://www.sdsc.edu/GatherScatter/Newssearch.html
enter the search string **([sardine anchovy] in the search engine)**
***result*=Genetic Variability In Fish Populations**
click on **(Genetic Variability In Fish Populations)**
http://www.sdsc.edu/GatherScatter/GSsummer96/gaggiotti.html

WEBSITE CONTENT EVALUATION:

* * *	Biology	*	Oceanography	Climate
	Industry	* * *	Research/Data	Publications
* *	Links	* * *	Images	Contacts

WEBSITE OVERVIEW:

This website is directly accessible by entering it into the web address line or by following the navigation paths described above. This four page website describes research into the genetic variability of fish populations (referencing sardines and anchovies) in the Northern Pacific Ocean. The reviewed research includes a description of CRAY C90 and T3D processors used to simulate sardine and anchovy populations which aids in the prediction of each population's respective genetic variability. The website includes superb multi-colored images and charts. Good links are part of the Table Of Contents page and the Search Engine page.

RELATED WEBSITE ADDRESS(ES):
http://www/sdsc/edi/SDSCwire/v2.12/t3speedup.html

RELATED WEBSITE OVERVIEW:

This page is directly accessible by entering it into the web address line. It provides a brief on a similar research project focused on accelerating a million years of evolution with a CRAY T3D.

~~~~~~

COLUMBIA BASIN RESEARCH LITERATURE DATABASE

WEBSITE ADDRESS(ES):
(Resources page)
http://www.cqs.washington.edu/resources.html
select **(Literature Database-fisheries and related literature)**
(Index)
http://www.cqs.washington.edu/crisp/lit/index.html
enter the search string **(sardine)**
***result*=three matches (click on any one of these at the search results page)**
~~~~~~

1) MOVING DIRECTION OF JAPANESE SARDINE SCHOOL ON THE BASIS OF AERIAL SURVEYS

2) RECONSTRUCTION OF THE HISTORY OF PACIFIC SARDINE AND NORTHERN ANCHOVY POPULATIONS OVER THE PAST TWO MILLENNIA FROM SEDIMENTS OF THE SANTA BARBARA BASIN, CALIFORNIA

3) DISTRIBUTION AND ABUNDANCE OF PELAGIC FISH OFF SPANISH SAHARA DURING CUEA EXPEDITION JOINT-I

return to index
***enter the search string* (anchovy)**
***result*=seven matches (click on any one of these at the search results page)**

1) MATHEMATICAL MODEL OF THE RELATIONSHIP BETWEEN LARVAL ANCHOVY (ENGRAULIS MORDAX) GROWTH, PREY MICRO-DISTRIBUTION, AND LARVA BEHAVIOR

2) MODEL OF THE DRIFT OF NORTHERN ANCHOVY, ENGRAULIS MORDAX, LARVAE IN THE CALIFORNIA CURRENT

3) FORMULATION OF GROWTH AND MORTALITY OF LARVAL NORTHERN ANCHOVY IN A TURBULENT FEEDING ENVIRONMENT

4) NON-LINEAR RESPONSE OF PLANKTON TO WIND MIXING EVENTS IMPLICATIONS FOR SURVIVAL OF LARVAL NORTHERN ANCHOVY

5) RECONSTRUCTION OF THE HISTORY OF PACIFIC SARDINE AND NORTHERN ANCHOVY POPULATIONS OVER THE PAST TWO MILLENNIA FROM SEDIMENTS OF THE SANTA BARBARA BASIN, CALIFORNIA

6) RESPONSES OF NORTHERN ANCHOVY, ENGRAULIS MORDAX, LARVAE TO PREDATION BY A BITING PLANKTIVORE, AMPHIPRION PERCULA

7) FEEDING SUCCESS OF CLUPEOID FISH LARVAE AND STOCHASTIC THINKING

***return to* (Resources Page)**
***enter* (Ocean Climate and Regime Shift Bibliography [includes abstracts])**
http://www.cqs.washington.edu/crisp/ocean/ocean.html
***select* (Baumgartner et al)**
http://www.cqs.washington.edu/crisp/ocean/baum.html
***select* (Ware and McFarlane)**
http://www.cqs.washington.edu/crisp/ocean/ware.html
***select* (Ware and Thomson)**
http://www.cqs.washington.edu/crisp/ocean/ware2.html
***select* (Wickett)**
http://www.cqs.washington.edu/crisp/ocean/ocean.htmlwickett.html

WEBSITE CONTENT EVALUATION:

* *	Biology	* *	Oceanography		Climate
	Industry	* * *	Research/Data	* * *	Publications
* *	Links		Images	*	Contacts

WEBSITE OVERVIEW:

These pages are accessible by following the navigation paths described above. Each page provides information leading to publications regarding sardines or anchovies in the Northern Pacific Ocean or abstracts about the various publications. The links and search engines are easy to use.

~~~~~~

NORTHERN ANCHOVY IN SAN FRANCISCO BAY

WEBSITE ADDRESS(ES):
http://www.iep.ca.gov/sdfg/na.html

WEBSITE CONTENT EVALUATION:

*	Biology	*	Oceanography		Climate
	Industry	* *	Research/Data		Publications
*	Links	* *	Images		Contacts

WEBSITE OVERVIEW:
This website is directly accessible by entering it into the web address line. It briefly describes the biology of the Northern Anchovy in the San Francisco Bay region. It includes a distribution map and a longitudinal index graph pertaining to abundance in the last 15 years. It also includes links to other portions of the monitoring program such as zooplankton and phytoplankton.

RELATED WEBSITE ADDRESS(ES):
(Interagency Ecological Program)
http://www.iep.ca.gov/sdfg/monitor.html

RELATED WEBSITE OVERVIEW:
This page is directly accessible by entering it into the web address line. It includes information about the monitoring project of the San Francisco Bay/Estuary Ecosystem in general.

~~~~~~

VOLUME OF FISHERIES CATCH IN LIVE WEIGH BY MAIN TYPE OF CONSUMPTION *(IN SPANISH)*

WEBSITE ADDRESS(ES):

http://www.inegi.gob.mx/homeing/estadistica/economia/biosa/bio-10.html

WEBSITE CONTENT EVALUATION:

	Biology		Oceanography		Climate
* * *	Industry	* * *	Research/Data		Publications
*	Links		Images		Contacts

WEBSITE OVERVIEW:

This website is directly accessible by entering it into the web address line. It provides an extensive table displaying direct and indirect consumption of a variety of fish and marine species for Mexico (including sardines and anchovies); the brief text (titles of columns & rows) is in Spanish. The data provides coverage of 1995 (full year), 1996 (full year-by month), and 1997 (full year-by month [currently not complete]). This is a wide page based upon "layout" format; it is possible to scroll to the right from the point of origin for more data. Additionally, it includes links back to the INEGI home page.

~~~~~~

INTERSPECIFIC AND INTRASPECIFIC RELATIONSHIPS OF THE COMMERCIAL SMALL-PELAGIC FISHES IN THE GULF OF CALIFORNIA, MEXICO *(IN SPANISH, WITH ENGLISH OPTION)*

WEBSITE ADDRESS(ES):

http://www.gym.itesm.mx/investigacion/pelagicos/pelagic.html ***(in Spanish)***
or select **(English version)**
http://www.gym.itesm.mx/investigacion/pelagicos/pelagicE.html ***(in English)***

WEBSITE CONTENT EVALUATION:

	Biology		Oceanography		Climate
	Industry	* * *	Research/Data	* *	Publications
* * *	Links	* * *	Images	* * *	Contacts

WEBSITE OVERVIEW:

This website is directly accessible by entering it into the web address line. This seven page website includes a very good description of research on small pelagic fishes. Extremely good images of the project in conjunction with good detail regarding the objective, collection, analysis, results ,as well as useful publication references provide insight into the
~~~~~~

fish ecology of the Gulf of California. Additionally, links to principal researchers (including address, phone numbers and interactive e-mail addresses) are included.

~~~~~~

CLIMATE CHANGE AND NORTHERN FISH POPULATIONS
(IN ENGLISH, WITH FRENCH OPTION)

WEBSITE ADDRESS(ES):
(Table of Contents)
http://www.cisti.nrc.ca/cisti/journals/books/
***select* (Climate Change and Northern Fish Populations)**
http://www.cisti.nrc.ca/cisti/journals/books/climate_e.html ***(in English)***
***select* (Francais on last page)**
http://www.cisti.nrc.ca/cisti/journals/books/climat_f.html ***(in French)***

WEBSITE CONTENT EVALUATION:

	Biology	* *	Oceanography	* *	Climate
	Industry		Research/Data	* * *	Publications
*	Links		Images		Contacts

WEBSITE OVERVIEW:
These pages are accessible by following the navigation paths described above. The five page website is a publication of Climate Change and Northern Fish Populations, which includes material on sardines and anchovies. By using the ***find button***, i.e. **[sardine; *result*= 4 matches/ anchovy; *result*= 1 match]**, location of the references to sardines and anchovies is easily accessible. Additionally, there are links to related website pages within the home page.

~~~~~~

JAPANESE NATIONAL FISHERIES RESEARCH INSTITUTES:
NANSEI, SEIKAI & TOHUKU

WEBSITE ADDRESS(ES):
http://www.itd.nrl.navy.mil/ONRA/oceans/aoi/1994_1/012494b.bio

WEBSITE CONTENT EVALUATION:

	Biology	* *	Oceanography	*	Climate
*	Industry		Research/Data		Publications
	Links		Images	* * *	Contacts

WEBSITE OVERVIEW:

This page is directly accessible by entering it into the web address line. This six page website provides information describing the objectives, research activities and contacts (some include phone numbers) of three Japanese National Fisheries Research Institutes. Each contributes information which is valuable to forecasting the fisheries dynamics (including sardines and anchovies) of the Japanese coastal waters. In particular, the Nansei National Fisheries Research Institute provides research information on sardines. The ***find button***, **(sardine; *result*= 6 matches/ anchovy; *result*= 1 match)**, provides easy navigation.

~~~~~~

EFFECTS OF INTERDECADAL CLIMATE VARIABILITY ON THE OCEANIC ECOSYSTEMS OF THE NE PACIFIC

WEBSITE ADDRESS(ES):

http://www.iphc.washington.edu/PAGES/IPHC/Staff/hare/html/papers/JClimate/Jclimate.html
***select* (Figure 12)**
http://www.iphc.washington.edu/PAGES/IPHC/Staff/hare/html/papers/JClimate/cfig12.gif
for more detail try
http://www.usglobec.berkeley.edu/usglobec/brochure/baumgartner.html

WEBSITE CONTENT EVALUATION:

	Biology	* * *	Oceanography	* * *	Climate
	Industry	* *	Research/Data	* *	Publications
*	Links	* *	Images	* *	Contacts

WEBSITE OVERVIEW:

This page is directly accessible by entering it into the web address line. This fourteen page website provides the full text of the paper <u>Effects of Interdecadal Climate Variability on Oceanic Ecosystems of the NE Pacific</u>. The paper includes the responses of sardines and anchovies to climate variability. To locate the sections pertaining to sardines and anchovies, ***use the find button* (sardine; *result*= 5 matches/anchovy; *result*= 4 matches)**. More than 15 images are included in this website; each provides unique insight to various aspects of the research. In particular, Figure 12 provides charts regarding the population dynamics of the Northern anchovy and Pacific sardine. For more detail regarding a portion of Figure 12, see the suggestion above to access the U.S. Globec site (Northern anchovy;Pacific sardine). An extensive list of references is included as well as the point of contact and the e-mail address of the principal researcher.

~~~~~~

DECADAL SCALE REGIME SHIFTS IN THE LARGE MARINE ECOSYSTEMS OF THE NORTH-EASE PACIFIC: A CASE FOR HISTORICAL SCIENCE

WEBSITE ADDRESS(ES):

http://www.iphc.washington.edu/PAGES/IPHC/Staff/hare/html/papers/francis-hare/franhare.html

select **(Abstract [Paper available in other versions])**

http://www.iphc.washington.edu/PAGES/IPHC/Staff/hare/html/papers/francis-hare/abst_f-h.html

WEBSITE CONTENT EVALUATION:

	Biology	*	Oceanography		Climate
	Industry	* * *	Research/Data	* *	Publications
*	Links		Images	* *	Contacts

WEBSITE OVERVIEW:

This page is directly accessible by entering it into the web address line. This fourteen page website provides the full text of the paper Decadal Scale Regime Shifts In The Large Marine Ecosystems of the North-east Pacific: A Case for Historical Science. This paper provides information on current research focused on large marine ecosystems for the purpose of characterizing the nature of order in these systems. The research applies the techniques of the historical-descriptive approach. Although principally focused on salmon and zooplankton populations, a large section cites examples of sardine and anchovy population dyanmics. To locate the sections pertaining to sardines and anchovies, ***use the find button*** **(sardine;** ***result*****= 17 matches/anchovy;** ***result*****= 15 matches)**. An extensive list of references is included as well as the principal researchers' point of contact and an interactive link to the home page of one of principal researcher. Additionally, an interactive abstract provides access to a page containing this paper saved in other versions , i.e. MS Word 7.0 & Adobe Acrobat .

~~~~~~
~~~~~~

****
OCEANIC REGION: South Pacific Ocean
The eastern coastal boundary of this region extends from Panama to Chile and the western coastal boundaries includes the coast of New Zealand. The region includes the Humboldt and the East Australian currents.
****

PERUVIAN ANCHOVY CASE

WEBSITE ADDRESS(ES):
http://gurukul.ucc.american.edu/ted/Anchovy.HTM

WEBSITE CONTENT EVALUATION:

* * *	Biology	* *	Oceanography	* *	Climate
* *	Industry	*	Research/Data	* *	Publications
*	Links		Images		Contacts

WEBSITE OVERVIEW:
This website is directly accessible by entering it into the web address line. It provides very detailed information regarding the Peruvian anchovy, including biology, oceanography (upwelling), geographic distribution of the fishery, climatolgy (El Nino/ENSO), industry records of historical catches, and very good publication references. The website is approximately eight pages long. Additionally, it includes internal links to similar cases provided by the TED (Trade and Environment Database) Projects.

RELATED WEBSITE ADDRESSES:
http://gurukul.ucc.american.edu/ted/SUPER.HTM

RELATED WEBSITE OVERVIEW:
This page is directly accessible by entering it into the web address line. The TED Super Page provides a resource to navigate around the Trade and Environment Database (TED) Home Page. It includes internal links to other TED projects and cases similiar to the one highlighted above.

~~~~~~
~~~~~~

THE IMPACT OF GLOBAL CLIMATE: EL NINO/SOUTHERN OSCILLATION

WEBSITE ADDRESS(ES):

http://www-leland.stanford.edu/%7Eekassoy/el_nino.html

WEBSITE CONTENT EVALUATION:

*	Biology	* * *	Oceanography	* * *	Climate
*	Industry		Research/Data		Publications
* *	Links	* * *	Images		Contacts

WEBSITE OVERVIEW:

This website is directly accessible by entering it into the web address line. Although dealing with El Nino/ENSO, a section of the 6 pages is focused on sardines and anchovies. The strengths of this website are the multi-colored images, clear depiction of the geography, and its description of the interaction of the oceanographic and climatic systems which clearly effect the sardine and anchovy fisheries off the Peruvian and Chilean coasts. Additionally, this page includes internal links for easy navigation and external links such as that to NOAA.

~~~~~~

PERUVIAN ANCHOVY LANDINGS

WEBSITE ADDRESS(ES):

http://www.crseo.ucsb.edu/geos/12511.html

WEBSITE CONTENT EVALUATION:

	Biology		Oceanography		Climate
* * *	Industry	* * *	Research/Data		Publications
	Links	* * *	Images		Contacts

WEBSITE OVERVIEW:

This website is directly accessible by entering it into the web address line. It is a brief page composed principally of a color-coded chart depicting a longitudinal report of Peruvian anchovy catches (from 1970-1989). It includes a brief narrative on the dynamics of the change in landings.

~~~~~~

BAUERLE LIMITADA *(In Spanish)*

WEBSITE ADDRESS(ES):

http://www.geocities.com/Eureka/Plaza/5949/bauerle.html

WEBSITE CONTENT EVALUATION:

*	Biology		Oceanography	Climate
* * *	Industry	* *	Research/Data	Publications
*	Links	* *	Images	Contacts

WEBSITE OVERVIEW:

This website is directly accessible by entering it into the web address line. It provides a brief biological description of anchovies, a multi-colored image of an anchovy, a table of catches based upon month and year (1994-1997) and a table depicting conversion of recent catches to finished products such as fish meal and fish oil. Additionally, it includes a link to the web page of the Republic of Chile Ministry of Economy, Growth and Development.

~~~~~~

REPUBLIC OF CHILE: MINISTRY OF ECONOMY, GROWTH AND DEVELOPMENT - FISH SPECIES *(In Spanish)*

WEBSITE ADDRESS(ES):

(Fish page)
http://www.subpesca.cl/peces.html
***select* (anchoveta)**
http://www.subpesca.cl/anchoveta.html
***select* (sardina espanola)**
http://www.subpesca.cl/sardinaesp.html
***select* (sardina comun)**
http://www.subpesca.cl/sardinacom.html

WEBSITE CONTENT EVALUATION:

* *	Biology		Oceanography	Climate
	Industry		Research/Data	Publications
*	Links	* * *	Images	Contacts
~~~~~~

WEBSITE OVERVIEW:

These pages are accessible by following the navigation paths described above. Each individual page provideds a vivid, color image, a brief description of geographic distribution and concise biological information of each species. Additionally, it includes internal links to the fish page index and an interactive e-mail address.

****
OCEANIC REGION: North Atlantic Ocean
The eastern coastal boundary of this region extend from the Iberian Peninsula to England and the western coastal boundaries extend from Florida to Canada. The region includes the Canary and the Gulf Stream currents
****

ICES COMMITTE, ENVIRONMENT AND FISHERIES PAGES

ACFM DOCUMENTS

WEBSITE ADDRESS(ES):

(Introduction To The ICES Fisheries Databank)
http://www.ices.dk/fish/fish.htm
***select* (Map of the ICES Fishing Areas)**
http://www.ices.dk/fish/fisharea.jpg
***select* (ACFM Documents)**
http://www.ices.dk/committe/acfm/reportdocs/
***select* (Underlying Directory Structure)**
***select* (Overview: 0-3-111.doc)**
http://www.ices.dk/committe/acfm/reportdocs/0-3-111.doc
***return to* (Underlying Directory Structure)**
***select* (Extracts: sar-soth.sss)**
http://www.ices.dk/committe/acfm/reportdocs/docs/extracts/Oct97/sar-soth.sss

***return to* (Underlying Directory Structure)**
***select* (Tables: t-3117a1.xls)**
http://www.ices.dk/committe/acfm/reportdocs/t-3117a1.xls

***return to* (Underlying Directory Structure)**
***select* (Tables: t-3117a2.doc)**
http://www.ices.dk/committe/acfm/reportdocs/docs/tables/t-3117a2.doc

WEBSITE CONTENT EVALUATION:

* *	Biology	* * *	Oceanography		Climate
* * *	Industry		Research/Data		Publications
*	Links	* *	Images		Contacts

WEBSITE OVERVIEW:

These pages, which are accessible by following the navigation paths described above, provide information about the North Atlantic fisheries in general (including a map of ICES fishing areas) and detailed information concerning the sardine fishery off the Iberian

Pennisula. The discussion of the sardine fishery contains very good biological and oceanographic background and extremely good information regarding catches and management (including informative tables and figures).
(Several of these pages end in *.doc or *.xls. Save to hard drive or floppy for easy access.)

ENVIRONMENTAL DATA CENTRE

WEBSITE ADDRESS(ES):

(Introduction To The ICES Environmental Data Center)
http://www.ices.dk/env/env.htm
***select* (Data Inventories)**
http://www.ices.dk/env/invent/index.html
***select* (contaminants in biota: SEARCH ENGINE)**
set parameters
default except the following:
***select none for* (invertebrates, birds and mammals)**
***select sardina pilchardus for* (fish)**
http://www.ices.dk/env/datinv2/datinv2b.htm
***select* View Listing**
http://www.ices.dk/env/datinv2/datinv2/out/p26522.htm

***return to* (Data Inventories)**
http://www.ices.dk/env/invent/index.html
***select* (contaminants and biological effects of contaminants in biota)**
http://www.ices.dk/env/invent.bioinv.html
***scroll down to Spain; select* (IEOC or IEOV)**
http://www.ices.dk/env/repfor/vlabos.htm#IEOC
http://www.ices.dk/env/repfor/vlabos.htm#IEOV
***scroll to the right of IEOC or IEOV; select* (first <u>O</u>)**
http://www.ices.dk/env/invent/IEOCcf.html#IEOC85
http://www.ices.dk/env/invent/IEOVcf.html#IEOV90

WEBSITE CONTENT EVALUATION:

* *	Biology		Oceanography		Climate
	Industry	* * *	Research/Data		Publications
*	Links		Images	*	Contacts

WEBSITE OVERVIEW:

These pages are accessible by following the navigation paths described above. Cumulatively, these pages provide detailed information concerning analytical studies performed on the liver and muscle tissue of *sardina pilchardus*. The data are characterized by latitude and longitude, date, laboratory, species, tissue sampled, contaminants tested and number of observations.

~~~~~~
~~~~~~

MAINE SARDINE COUNCIL

WEBSITE ADDRESS(ES):

http://www.mint.net/sardine/

WEBSITE CONTENT EVALUATION:

	Biology		Oceanography		Climate
*	Industry		Research/Data		Publications
* *	Links		Images	* * *	Contacts

WEBSITE OVERVIEW:

This website is directly accessible by entering it into the web address line. It provides historical and commercial information about the Maine Sardine Industry. The page includes good contact information and useful internal links to pages pertaining to commercial aspects of the sardine fishery , i.e. Maine Sardine Companies displays contact information regarding the major companies on the council.

~~~~~~
~~~~~~

****

OCEANIC REGION: South Atlantic Ocean

The eastern coastal boundary of this region extends from Gabon to South Africa and the western coastal boundaries extends from Brazil to Argentina. The region includes the Benguela and Brazil currents.

****

BRAINERD, THEOPHILUS R. (1991) THE SARDINELLA FISHERIES OFF THE COAST OF WEST AFRICA:THE CASE OF A COMMON PROPERTY RESOURCE

WEBSITE ADDRESS(ES):

http://www.indiana.edu/~libref/iascpabs/0057.html

WEBSITE CONTENT EVALUATION:

	Biology		Oceanography		Climate
* *	Industry		Research/Data	* *	Publications
	Links		Images		Contacts

WEBSITE OVERVIEW:

This page, which is directly accessible by entering it into the web address line, contains an abstract fromt the paper The Sardinella Fisheries Off The Coast of West Africa: The Case of a Common Property Resource. This page is brief and does not include links or contacts.

~~~~~~

OTOLITH RESEARCH AT THE ELECTRON MICROSCOPE UNIT (MIRANDA WALDRON, UNIVERSITY OF CAPE TOWN)

WEBSITE ADDRESS(ES):

http://www.uct.ac.za/depts/emu/otolith/OTOWEB.HTM

WEBSITE CONTENT EVALUATION:

	Biology		Oceanography		Climate
	Industry	* * *	Research/Data	* *	Publications
	Links	* * *	Images		Contacts
~~~~~~

WEBSITE OVERVIEW:

This page, which is directly accessible by entering it into the web address line, is a brief description of otolith research in South Africa . It addresses the estimate of the age of both the South African anchovy *(Engraulis capensis)* and South African sardine *(Sardinops sagax)*. The purpose of this research is to validate annual hyaline rings by counting daily increments with an electron microscope. The page additionally provides good reference material and exceptional images.

~~~~~~

DISTRIBUTION AND ABUNDANCE OF SOUTHWEST ATLANTIC ANCHOVY SPAWNERS *(ENGRAULIS ANCH OITA)* IN RELATION TO OCEANOGRAPHIC PROCESSES IN THE SOUTHERN BRAZILIAN SHELF

WEBSITE ADDRESS(ES):

http://nauplius.rsmas.miami.edu/home/apaper/apaper.html
***select next or point of interest from table of contents on home page , i.e. select* Introduction**
***select* (Introduction)**
http://nauplius.rsmas.miami.edu/home/apaper/node1.html
***select* (Methods)**
http://nauplius.rsmas.miami.edu/home/apaper/node2.html
***select* (Physical environment)**
http://nauplius.rsmas.miami.edu/home/apaper/node3.html
***select* (Assessment of distribution and abundance)**
http://nauplius.rsmas.miami.edu/home/apaper/node4.html
***select* (Results)**
http://nauplius.rsmas.miami.edu/home/apaper/node5.html
***select* (Physical environment)**
http://nauplius.rsmas.miami.edu/home/apaper/node6.html
***select* (Sea surface temperature; SST)**
http://nauplius.rsmas.miami.edu/home/apaper/node7.html
***select* (Wind stress)**
http://nauplius.rsmas.miami.edu/home/apaper/node8.html
***select* (Ekman transport)**
http://nauplius.rsmas.miami.edu/home/apaper/node9.html
***select* (Vertical structure)**
http://nauplius.rsmas.miami.edu/home/apaper/node10.html
***select* (Anchovy biomass and distribution)**
http://nauplius.rsmas.miami.edu/home/apaper/node11.html
***select* (Discussion)**
http://nauplius.rsmas.miami.edu/home/apaper/node12.html
***select* (The anchoita and its physical environment)**
http://nauplius.rsmas.miami.edu/home/apaper/node13.html
***select* (Anchovy biomass and distribution assessment)**
http://nauplius.rsmas.miami.edu/home/apaper/node14.html
***select* (Acknowledgements)**
http://nauplius.rsmas.miami.edu/home/apaper/node15.html
***select* (References)**
http://nauplius.rsmas.miami.edu/home/apaper/node16.html
~~~~~~

select **(About this document...)**
http://nauplius.rsmas.miami.edu/home/apaper/node17.html

WEBSITE CONTENT EVALUATION:

* * *	Biology	* * *	Oceanography	* * *	Climate
	Industry	* * *	Research/Data	* * *	Publications
* *	Links	* * *	Images	* *	Contacts

WEBSITE OVERVIEW:

These pages, which are accessible by following the navigation paths described above, provides the full text of the publication, Distribution and Abundance of Southwest Atlantic Anchovy Spawners (Engraulis ancoita) in Relation to Oceanographic Processes in the Southern Brazilian Shelf. This report covers the biological, oceanographic and climatic influences on the Southwest Atlantic anchovy *(Engraulis anchoita)*. Easy navigation between these pages is available by simply selecting next/previous or by selecting a point of interest from the table of contents on the home page. An extensive list of publications can be narrowed by simply using the find button: **[*enter* sard, anch or pelagic]** to find the references which include these search words in the title of each reference. **[*Results*= sard (3); anch (15); pelagic (4)]**. Additionally, this page includes very useful maps of SST, wind stress, Eckman transport as well as tables of biomass and distribution.

~~~~~~

SEA FISHERIES RESEARCH INSTITUTE

WEBSITE ADDRESS(ES):

Home Page
http://www.gov.za/sfri/sfri.htm
Under Sub-directorates and divisions:
select **(Surveys and Fish Behaviour)**
http://www.gov.za/sfri/surfish.htm

return to **(Home Page)**
http://www.gov.za/sfri/sfri.htm
Under Other Information:
select **(Recent Publications and Research Highlights)**
http://www.gov.za/sfri/pubhil.htm
select **(Papers and Articles)**
http://www.gov.za/sfri/publicat.htm
return to **(Recent Publications and Research Highlights)**
http://www.gov.za/sfri/pubhil.htm
select **(The History of South African Fisheries)**
http://www.gov.za/sfri/safish.htm
return to **(Recent Publications and Research Highlights)**
http://www.gov.za/sfri/pubhil.htm
select **(Research Highlights; 1994/1995; Studies on Resources)**
~~~~~~

http://www.gov.za/sfri/reshil94.htm

return to **(Recent Publications and Research Highlights)**
http://www.gov.za/sfri/pubhil.htm
select **(Research Highlights; 1995/1996; Studies on Resouces)**
http://www.gov.za/sfri/reshil.htm

WEBSITE CONTENT EVALUATION:

* *	Biology	* * *	Oceanography	* *	Climate
* *	Industry	* * *	Research/Data	* * *	Publications
* * *	Links		Images		Contacts

WEBSITE OVERVIEW:

These pages are accessible by following the navigation paths described above. The first selection of website pages under Sub-directorates and Divisions contain a good overview of surveys of fish behaviour off the coast of South Africa. The second selection of pages under **other information** provide more detailed information regarding the pilchard and anchovy stocks, including research results and survey methods. In particular, the 1994/1995 and 1995/1996 studies on resources provide excellent material with large sections devoted to pilchards and anchovys. Additionally, the section titled Recent Publications provides a host of publications for further research on the topic of pilchard and anchovy. Lastly, the internal links are very easy to use.

RELATED WEBSITE ADDRESS(ES):

http://www.gov.za/sfri/white.htm

RELATED WEBSITE OVERVIEW:

This site, which can be accessed by entering it directly into the web address line, is forty-three pages of information on South Africa's fisheries. The page is principally dedicated toward commercial fishing with emphasis on the procedures, bureaucratic bodies and legislative aspects of the fishing industry. In the background section, three pages are dedicated to the pelagic fishery.

~~~~~~
~~~~~~

****

OCEANIC REGION: Indian Ocean

The eastern coastal boundary of this region is western coast of Australia and the western coastal boundary is the coast of Africa. The region includes the Agulhas and the West Australian currents.

****

AUSTRALIAN PILCHARD MORTALITIES

WEBSITE ADDRESS(ES):

(Lists)
http://dfomr.dfo.ca/science/mesd/he/lists/
***select* (Older Messages),**
***remove* index.html**
***replace with* msg00255.html or msgg00258.html or msg00270.html**
http://dfomr.dfo.ca/science/mesd/he/lists/msg00255.html
http://dfomr.dfo.ca/science/mesd/he/lists/msg00258.html
http://dfomr.dfo.ca/science/mesd/he/lists//msg00270.html

WEBSITE CONTENT EVALUATION:

* *	Biology		Oceanography		Climate
	Industry		Research/Data		Publications
*	Links		Images	* * *	Contacts

WEBSITE OVERVIEW:

These pages, which are accessible by following the navigation paths described above, provide good information about 1995 pilchard dieoffs near Australia. The three pages provide an abstract on the phenomenon, contact information (phone numbers and e-mail links) and internal links aiding navigation through the main index.

~~~~~~
~~~~~~

NEW ZEALAND PILCHARD MORTALITIES

WEBSITE ADDRESS(ES):

http://healthnet.org/programs/promed-hma/9506/msg00091.html
http://healthnet.org/programs/promed-hma/9506/msg00107.html
http://healthnet.org/programs/promed-hma/9506/msg00115.html

WEBSITE CONTENT EVALUATION:

* *	Biology		Oceanography		Climate
	Industry		Research/Data		Publications
*	Links		Images	* * *	Contacts

WEBSITE OVERVIEW:

These pages are directly accessible by entering each into the web address line. Each provides good information about 1995 pilchard dieoffs near New Zealand. The three pages provide an abstract on the phenomenon, contacts (phone numbers and e-mail links) and internal links aiding navigation through the main index.

~~~~~~

FISHERIES OF ERITREA

WEBSITE ADDRESS(ES):

http://www.gisl.co.uk/MacAlister-Elliott/jg1.htm
http://www.gisl.co.uk/MacAlister-Elliott/jg2.htm

WEBSITE CONTENT EVALUATION:

	Biology		Oceanography	*	Climate
* *	Industry	* *	Research/Data		Publications
*	Links	* *	Images	*	Contacts

WEBSITE OVERVIEW:

This website is directly accessible by entering it into the web address line. At the end of the first page is a link connecting to the second page. It provides good information and data (charts and tables) regarding the fisheries of this region. Although sardines and anchovies are discussed throughout these pages, the charts and tables presented reflect more general groupings.

~~~~~~

WESTERN AUSTRALIAN FISHERIES-FINFISH

WEBSITE ADDRESS(ES):

http://www.wa.gov.au/gov/cabinet/house/fisheries/finfish.html
http://www.wa.gov.au/gov/cabinet/house/finfish.html

WEBSITE CONTENT EVALUATION:

	Biology	*	Oceanography		Climate
* *	Industry	* *	Research/Data		Publications
	Links	*	Images		Contacts

WEBSITE OVERVIEW:

This website which is directly accessible by entering each into the web address line, provides good text regarding catches and economics of the important finfish species in the Western Australian fisheries, including specific data on pilchards (see second page). Both pages included a color-coded map of the region defining specific fisheries by group type.

~~~~~~

SPENCER GULF PILCHARD DATA

WEBSITE ADDRESS(ES):

http://www.aodc.gov.au/bluepages/directory/sardi/003344.html

WEBSITE CONTENT EVALUATION:

	Biology		Oceanography		Climate
* * *	Industry	* * *	Research/Data		Publications
	Links		Images	* * *	Contacts

WEBSITE OVERVIEW:

This page is directly accessible by entering it into the web address line. The page contains a description of datasets regarding commercial catches of pilchards in the Spencer Gulf fishery, South Australia. The dataset is formatted in Excel spreadsheets. There are contacts of names, addresses, e-mail links and phone numbers.

~~~~~~

****

FISH SPECIES LISTINGS

These sites provide species information, and some of these sites provide extensive and detailed biological information. These sites are a good resource for further INTERNET research by providing species names. Many of the sites are in languages other than English.

****

MARINE AND COASTAL SPECIES INFORMATION SYSTEM-FISH

WEBSITE ADDRESS(ES):

(Index)
http://www.fw.vt.edu/fishex/mac_spec/fish.htm (listing)
***select* (Bay Anchovy [*Anchoa mitchilli*])**
http://www.fw.vt.edu/fishex/macsis/M010060.htm
***select* (Deepbody Anchovy [*Anchoa compressa*])**
http://www.fw.vt.edu/fishex/macsis/M010301.htm
***select* (Northern Anchovy [*Engraulis mordax*])**
http://www.fw.vt.edu/fishex/macsis/M010060.htm
***select* (Striped Anchovy [*Anchoa hepsetus*])**
http://www.fw.vt.edu/fishex/macsis/M010061.htm

WEBSITE CONTENT EVALUATION:

* * *	Biology	* *	Oceanography		Climate
	Industry	* * *	Research/Data	* *	Publications
* *	Links		Images		Contacts

WEBSITE OVERVIEW:

This four page site is accessible by following the navigation paths described above. It provides an interactive list of fish species from which one can obtain detailed information . This information includes taxonomy, trophic level, life stage, habitat, and biology. ***select* (anchoa, bay [*Anchoa mitchilli*] *reult*= 15 pages of detailed data)**.

~~~~~~
~~~~~~

FDA FISH LIST: MARKET NAMES OF FISH

WEBSITE ADDRESS(ES):

http://vm.cfsan.fda.gov/~ear/seafood.html

WEBSITE CONTENT EVALUATION:

Biology	Oceanography		Climate
Industry	Research/Data		Publications
Links	Images	* *	Contacts

WEBSITE OVERVIEW:

The intent of this website is to promote uniformity in the use of FDA acceptable market names by the fish industry. It contains 113 pages of the market, scientific, commercial and vernacular names of fish species. To locate the sections pertaining to anchovies, pilchards and sardines, ***use the find button; enter*** **(anchovy; *result=60 matches*; pilchard; *result=21 matches*; sardine; *result=20 matches)***. Additionally, contact information is included in the initial sections of the website.

~~~~~~

COLECCION ICTIOLOGICA DEL CICIMAR *(IN SPANISH)*

WEBSITE ADDRESS(ES):

(Index)
http://www.cicimar.ipn.mx/coleccio/princip.htm
select **(letter A)**
http://www.cicimar.ipn.mx/coleccio/PAG_A.HTM
select **(*Achoa argentivitata*)**
http://www.cicimar.ipn.mx/coleccio/anch15.htm
select **(*Anchoa exigua*)**
http://www.cicimar.ipn.mx/coleccio/anch16.htm
select **(*Anchoa ischana*)**
http://www.cicimar.ipn.mx/coleccio/anch17.htm
select **(*Anchoa lucida*)**
http://www.cicimar.ipn.mx/coleccio/anch18.htm
select **(*Anchovia macrolepidota*)**
http://www.cicimar.ipn.mx/coleccio/anch19.htm
select **(*Anchovia magdalenae*)**

return to **(Index)**
select **(letter E)**
http://www.cicimar.ipn.mx/coleccio/pag_e.htm
select **(*Engraulis Mordax*)**
http://www.cicimar.ipn.mx/coleccio/Engr149.htm
~~~~~~

***return to* (Index)**
***select* (letter S)**
http://www.cicimar.ipn.mx/coleccio/PAG_S.HTM
***select* (*Sarda chiliensis*)**
http://www.cicimar.ipn.mx/coleccio/sard379.htm
***select* (*Sardinops caeruleus*)**
http://www.cicimar.ipn.mx/coleccio/sard380.htm

WEBSITE CONTENT EVALUATION:

* *	Biology	*	Oceanography		Climate
*	Industry		Research/Data	*	Publications
* * *	Links		Images	* *	Contacts

WEBSITE OVERVIEW:

These pages are accessible by following the navigation paths described above. It provides good but brief material concerning biology, distribution, economic significance and reference material. Additionally, there are very good links and an interactive e-mail address.

~~~~~~

FISH MERCHANTS: FRESH FISH, POISSON FRAIS, ...

WEBSITE ADDRESS(ES):

(Index)
http://www.fishroute.com/101a.htm
***select* (Anchovy)**
http://www.fishroute.com/103e.htm

***return to* (Index)**
http://www.fishroute.com/101a.htm
***select* (Sardine)**
http://www.fishroute.com/132e.htm

WEBSITE CONTENT EVALUATION:

	Biology	Oceanography	Climate
	Industry	Research/Data	Publications
*	Links	Images	Contacts
~~~~~~

WEBSITE OVERVIEW:

This website which is accessible by following the navigation paths described above, is two pages (in wide layout format) of the names fish species in various languages. Additionally, the English version of each species includes an interactive link to a listing of international companies involved in the commercial exploitation of the species stock. Some of the listed companies include interactive e-mail addresses.

~~~~~~
~~~~~~

****

INDUSTRY

These sites focus on the operation of fisheries. The sites provide information that is not exclusively related to the small pelagics.

****

MARSOURCE

WEBSITE ADDRESS(ES):

(Site Map)
http://www.marsource.maris.int/site-map.html
***select* (Search)**
http://www.marsource.maris.int/search.html **(*enter;* "anchovy or sardine")**
***results* =List of Research or MARSOURCE options with percentage of match agreement displayed. For example:**
65% Research: FAR1: Contract Nr. FAR1 CTO-0096 Summary:
- developing and refining quantitative methods for the measurement of larval condition.-relating larval survival to oceanographic conditions and food availability. DE-27568 Bremerhaven. Sektion Biologie I Universidade de Lisboa. Faculdade de Ciencias- Departamento de Zoologia e Antaropologia.
***return to* (Site Map)**
http://www.marsource.maris.int/site-map.html
***select* (Foreign Trade Statistics)**
http://www.marsource.maris.int/marsource/owa/Trade.Results

WEBSITE CONTENT EVALUATION:

* *	Biology		Oceanography	Climate
* * *	Industry	* * *	Research/Data	Publications
* *	Links		Images	Contacts

WEBSITE OVERVIEW:

These pages are accessible by following the navigation paths described above. The search engine for the website pages above provides good access to a host of research projects concerning sardines and anchovies. Follow the suggestion above to obtain a large selection of research information. Additionally, the trade information allows the researcher to set paratmeters to obtain the best data. For example, year, product and country may be selected to generate tables based upon import and export value and quantity.

~~~~~~
~~~~~~

POLLUTION PREVENTION AND CONTROL IN THE SEAFOOD INDUSTRY
(PARTICULARILY FOR SMALL AND MEDIUM SIZED PLANTS)

WEBSITE ADDRESS(ES):

(Index)
http://www.cepis.org.pe/muwww/fulltext/epa/pcsi/
select **(pcscind.html)**
http://www.cepis.org.pe/muwww/fulltext/epa/pcsi/pcsind.html
select **(Introduction)**
http://www.cepis.org.pe/muwww/fulltext/epa/pcsi/pcscap01.html
select **(Critical assumptions regarding the Peruvian fishmeal industry)**
http://www.cepis.org.pe/muwww/fulltext/epa/pcsi/pcscap03.html
select **(Raw material quality)**
http://www.cepis.org.pe/muwww/fulltext/epa/pcsi/pcscap04.html
select **(The unloading process)**
http://www.cepis.org.pe/muwww/fulltext/epa/pcsi/pcscap05.html

return to **(Index)**
http://www.cepis.org.pe/muwww/fulltext/epa/pcsi/
select **(pcsfig.html)**
http://www.cepis.org.pe/muwww/fulltext/epa/pcsi/pcsfig.html
select **(Figure 1-Peruvian landings Vs fishmeal landings)**
http://www.cepis.org.pe/muwww/fulltext/epa/pcsi/pcsfig01.html
select **(Figure 2-Estimated losse in the Peruvian fishmeal industry 1950-1994)**
http://www.cepis.org.pe/muwww/fulltext/epa/pcsi/pcsfig02.html
select **(Figure 10-5 year average [1991-1995] landings of fish at Peruvian ports)**
http://www.cepis.org.pe/muwww/fulltext/epa/pcsi/pcsfig10.html
select **(Figure 45-Summary of yield and economic losses by processing step)**
http://www.cepis.org.pe/muwww/fulltext/epa/pcsi/pcsfig45.html
select **(Figure 62-The environmental dilemma)**
http://www.cepis.org.pe/muwww/fulltext/epa/pcsi/pcsfig62.html

WEBSITE CONTENT EVALUATION:

	Biology		Oceanography	Climate
* * *	Industry	* *	Research/Data	Publications
*	Links	*	Images	Contacts

WEBSITE OVERVIEW:

These pages are accessible by following the navigation paths described above. The two groupings of website pages (pcscind.html & pcsfig.html) complement one another. Cumulatively, these pages provide good information detailing measures to prevent fishmeal contamination and subsequent losses. The information is presented in context with overall catches emphasizing the need to reduce fishmeal losses through more efficient processing (including information regarding anchovies in the pages cited above). The data is supported by charts and tables as well brief text summaries. Internal links aid navigation throughout these pages.

~~~~~~

MEGAPESCA

WEBSITE ADDRESS(ES):

(Home Page)
http://www.gisl.co.uk/Megapesca
***select* (A Review of Some Current Issues in Fisheries Development)**
http://www.gisl.co.uk/Megapesca/issues.htm
***select* (Utilisation of Small Pelagic Fish)**
***return to* (A Review of Some Current Issues in Fisheries Development)**
http://www.gisl.co.uk/Megapesca/issues.htm
***select* (Resource Management)**

WEBSITE CONTENT EVALUATION:

*	Biology		Oceanography	Climate
* *	Industry		Research/Data	Publications
*	Links	*	Images	Contacts

WEBSITE OVERVIEW:

These pages are accessible by following the navigation paths described above. It provides fisheries development information (including small pelagics: anchovies and sardines). The principal focus of this page is fisheries development and products (eg. fish meal and oil). Several charts provide insight into global catches of various species (including anchoveta) and a time series chart (Jan 1990-April 1994) pertaining to Black Sea Anchovy trading. Internal links between the subsections of this website aid in navigation.

~~~~~~

FISH INFO SERVICE ***(IN ENGLISH, WITH SPANISH, JAPANESE & CHINESE OPTIONS)***

WEBSITE ADDRESS(ES):

(Index)
http://www.sea-world.com
select **(Search)**
enter **(sardine and/or anchovy)**
http://www.sea-world.com/fis/search/search.htm
this list is updated regularly; thus the listings change often

return to **(Index)**
http://www.sea-world.com
select either **(Market Reports or Hot News)**
For example, select **(Market Reports)**
http://www.sea-world.com/fis/reports/reports.htm

select **(Pelagic)**
http://www.sea-world.com/fis/reports/pelagic.htm
scroll through the entire list (updated ~twice a month), each page may contain commercial reports regarding anchovies and/or sardines along with other species-the same method applies for **Hot News.**

return to **(Index)**
http://www.sea-world.com
select **(Hot News)**
http://www.sea-world.com/fis/hotnews/default.asp
provides an up-to-date list of the latest monthly news pertaining to global fisheries; previous months are accessible by clicking on the name of the previous month on each page.

WEBSITE CONTENT EVALUATION:

*	Biology		Oceanography		Climate
* * *	Industry		Research/Data	* *	Publications
* * *	Links	* * *	Images	* *	Contacts

WEBSITE OVERVIEW:

These pages are accessible by following the navigation paths described above. The pages provide very good, up-to-date information regarding commercial activities; yet they include additional information such as climate, regulations, pollution, etc. The internal links provide good access to a wealth of up-to-date information within the website. To locate the sections including material related to anchovies and sardines, utilize the search engine described above. Additionally, the page is available *in Spanish, Japanese and Chinese.* This page is very image intensive; searches will take extra time.

~~~~~~
~~~~~~

****

PUBLICATIONS

These sites are built around publications, and some provide valuable search engines for finding publications. Certain sites provide abstracts while others present a single publication.

****

PUBLICACIONES *(IN BOTH SPANISH AND ENGLISH)*

WEBSITE ADDRESS(ES):

http://www.cicese.mx/~ghammann/mgh_pub.htm

WEBSITE CONTENT EVALUATION:

Biology	Oceanography		Climate
Industry	Research/Data	* * *	Publications
Links	Images		Contacts

WEBSITE OVERVIEW:

This page is directly accessible by entering it into the web address line. This two-page website provides access to a short list of publications in both Spanish and English. ***Use the find button*** **(sard; *result*=4/anch; *result*=2/engr; *result*=2)** to quickly locate the articles pertaining to sardines and anchovies.

~~~~~~

INTER-RESEARCH ABSTRACT SEARCH

WEBSITE ADDRESS(ES):

(Inter-Research Abstract Search)
http://www.int-res.com/cgi-bin/wwwwais
enter **(anch*; *result*=12 matches [Best matches below])**

http://www.int-res.com/journals/meps/160/m160p121.abs.html
http://www.int-res.com/journals/meps/121/m121p027.abs.html
http://www.int-res.com/journals/meps/151/m151p191.abs.html
http://www.int-res.com/journals/meps/140/m140p271.abs.html
http://www.int-res.com/journals/meps/138/m138p015.abs.html
http://www.int-res.com/journals/meps/131/m131p061.abs.html
http://www.int-res.com/journals/meps/129/m129p055.abs.html
http://www.int-res.com/journals/meps/129/m129p041.abs.html
http://www.int-res.com/journals/meps/127/m127p015.abs.html
~~~~~~

enter **(sard*; *result*=9 matches [Best matches below])**

http://www.int-res.com/journals/dao/28/d028p051.abs.html
http://www.int-res.com/journals/dao/28/d028p001.abs.html
http://www.int-res.com/journals/dao/28/d028p017.abs.html
http://www.int-res.com/journals/meps/129/m129p041.abs.html
http://www.int-res.com/journals/meps/152/m152p241.abs.html
http://www.int-res.com/journals/meps/127/m127p015.abs.html

WEBSITE CONTENT EVALUATION:

	Biology		Oceanography		Climate
	Industry		Research/Data	* * *	Publications
* *	Links		Images	* *	Contacts

WEBSITE OVERVIEW:

This website, which is directly accessible by entering it into the web address line, provides access to marine related publications. Follow the suggestions above to locate abstracts of volumes which pertain to sardines and anchovies. Select each individual document from the search string results page to access the abstracts. The abstracts provide e-mail, phone and fax numbers for the Inter-Research Science Publisher for further inquiry. It also provides details about the journal, volume and pages. Interactive internal links are provided for navigation throughout the website.

RELATED WEBSITE ADDRESS(ES):

(Marine Ecology Progress Series)
http://www.int-res.com/journals/meps/

RELATED WEBSITE OVERVIEW:

This website is directly accessible by entering it into the web address line. It is a similar to the page detailed above and provides access to similar publications. Utilize the suggestions above to locate publications relevant to sardines and anchovies.

~~~~~~

SPRINGER LINK

WEBSITE ADDRESS(ES):

(Link Search)
http://link.springer.de/search.htm
select **(all libraries);** *enter* **(anchovy sardine)**
results=**16 documents [eight listed below]**
Marine Biology-
http://link.springer.de/link/service/journals/00227/bibs/7127003/71270369.htm
http://link.springer.de/link/service/journals/00227/bibs/7128003/71280363.htm
http://link.springer.de/link/service/journals/00227/bibs/7130002/71300277.htm
~~~~~~

Zeitschrift fur Lebensmittleuntersuchung und-forschung-
http://link.springer.de/link/service/journals/00227/bibs/7204002/72040121.htm
http://link.springer.de/link/service/journals/00227/bibs/7204002/72040113.htm
http://link.springer.de/link/service/journals/00227/bibs/8206001/82060029.htm
http://link.springer.de/link/service/journals/00227/bibs/7205006/72050419.htm
http://link.springer.de/link/service/journals/00227/bibs/7204001/72040013.htm

WEBSITE CONTENT EVALUATION:

	Biology		Oceanography		Climate
	Industry		Research/Data	* * *	Publications
* *	Links		Images	*	Contacts

WEBSITE OVERVIEW:

This website, which is directly accessible by entering it into the web address line, provides access to marine related publications. Follow the suggestions above to locate abstracts of volumes which pertain to sardines and anchovies. Select each individual from the search string results page to access the abstracts. Very good internal links provide easy navigation within the website, including a link to a PDF format. Additionally, the abstracts provide e-mail to the provider.

~~~~~~

BLACKWELL SCIENCE

WEBSITE ADDRESS(ES):

(Search engine)
http://www.blackwell-science.com/search.htm
enter **(Sardine; *result*=[7 matches]**
select each volume , scroll through all the articles or use the find button;
enter **[sard and pelagic]**
return to **(Search engine)**
http://www.blackwell-science.com/search.htm
enter **(Ancovy; *result*=[4 matches])**
follow suggestions above for sardine; exception enter **[anch and pelagic]**

WEBSITE CONTENT EVALUATION:

	Biology		Oceanography		Climate
	Industry		Research/Data	* * *	Publications
* *	Links		Images		Contacts
~~~~~~

WEBSITE OVERVIEW:

This website is directly accessible by entering it into the web address line. It provides access to a host of journals. Follow the suggestions above to locate the journals and articles. ***Select any of the volumes, this provides access to the title and a brief description of each article within the volume. Once within the volume, the specific articles may be located by using the find button (see above).***

~~~~~~

OCEANOGRAPHIC LITERATURE REVIEW
(FORMERLY DEEP SEA RESEARCH PART B)

WEBSITE ADDRESS(ES):

(Table of Contents)
http://www.elsevier.nl/estoc/publications/store/3/09670653/
***select* (A Volume/Issue);**
use find button within the* Volume/Issue*;
***enter* (sard or anch or pelagic)**

Expected Match Results for Interactive Volume/Issue*:*

Volume##,Issue##	Sard	Anch	Pelagic	
Volume44,Issue11	5	3	3	
Volume44,Issue10	1	1	4	
Volume44,Issue9		4	2	8
Volume44,Issue8		2	1	8
Volume44,Issue7		1	0	6
Volume44,Issue6		1	1	8
Volume44,Issue5		0	0	7
Volume44,Issue4		1	1	10
Volume44,Issue3		0	2	10
Volume44,Issue2		0	1	0
Volume44,Issue1		0	0	4
Volume43,Issue12	0	1	7	
Volume43,Issue11	3	4	11	
Volume43,Issue10	3	1	7	
Volume43,Issue9		1	1	9
Voluem43,Issue8		2	0	3
Volume43,Issue7		1	1	5
Volume43,Issue6		1	2	7
Volume43,Issue5		0	4	6
Volume43,Issue4		2	0	3
Volume43,Issue3		1	0	4
Volume43,Issue2		0	1	7
Volume43,Issue1		1	1	7
Volume42,Issue12	0	2	7	
Volume42,Issue11	0	0	0	
Volume42,Issue10	1	1	2	
Volume42,Issue9		0	1	12
~~~~~~

Volume42,Issue8	**2**	**0**	**5**
Volume42,Issue7	**0**	**5**	**8**
Volume42,Issue6	**0**	**2**	**8**
Volume42,Issue5	**0**	**1**	**4**

WEBSITE CONTENT EVALUATION:

	Biology	Oceanography	Climate
	Industry	Research/Data	* * * Publications
* *	Links	Images	Contacts

WEBSITE OVERVIEW:

This website is directly accessible by entering it into the web address line. The website provides access to the contents (title, author and page) of each interactive Volume/Issue. Follow the suggestions above to locate the volumes and issues which pertain to sardines and anchovies. Additionally, there are good internal links.

~~~~~~

GLOBEC KEY REFERENCES

WEBSITE ADDRESSES:

(Index)
http://www1.npm.ac.uk/globec/index.htm
select **(Science Plan)**
http://www1.npm.ac.uk/globec/scienc~1.htm
select **(6.0 Key References)**
http://www1.npm.ac.uk/globec/Scienc~2.htm
use the find button**;** ***enter*** **[anch;** ***result*****=10 matches/sard;** ***result*****=9 matches, pelagic;** ***result*****=15 matches])**

WEBSITE CONTENT EVALUATION:

	Biology	Oceanography	Climate
	Industry	Research/Data	* * * Publications
* *	Links	Images	Contacts
~~~~~~

WEBSITE OVERVIEW:

This website is accessible by following the navigation paths described above. The 17 pages found here provides a selection of recent papers published in journals and cumulatively summarizes the research background for the GLOBEC program. To find the papers which pertain to sardines and anchovies, follow the suggestions above. This website includes good internal links.

~~~~~~

THYNNUS PUBLICATION LISTING

WEBSITE ADDRESS(ES):

http://thynnus.fnr.umass.edu/tuna

WEBSITE CONTENT EVALUATION:

Biology	Oceanography		Climate
Industry	Research/Data	* * *	Publications
Links	Images		Contacts

WEBSITE OVERVIEW:

This website is directly accessible by entering it into the web address line. Its 7 pages are laid out in wide format. Although the site focus on tuna fish, it also includes works include information on sardines, anchovies and pilchards. **To locate the specific pieces which pertain to these fish types,** ***use the find button; enter*** **(anch;** ***result*****=4 matches/pilchard;** ***resutl*****=3 matches/sard;** ***result*****=2 matches).** ****Note that this page is in layout format therefore scroll to the right when a match is indicated but not visible on the monitor screen.***

~~~~~~

SOUTH ATLANTIC FISHERIES MANAGEMENT COUNCIL

WEBSITE ADDRESS(ES):

http://www.safmc.nmfs.gov/Databases/AppleSearch.acgi$FORM
set parameters; enter in **Search For Box (sardine anchovy);** ***activate all of the info sources to search.by clicking on each*****;** ***results*****= 9 matches**
click on the interactive web address line for each of the 9 matches
Search A produces:
Amidei, Rosemary (ed.) 1985 Applications of remote sensing to fisheries and coastal resources.
Search D produces:
1980 Fence in the water: a film about weir fishing for sardines --transcript.
Search H produces:
Hu, Teh-Wei, Dressel, David M., and D. Lynne 1983 The Maine sardine industry:

An economic profile for policy and regulatory analysts.
Search K produces:
Kolberg, W. 1984 A comparison of alternative instruments of fishery regulation under uncertainty: An application to the Northern Anchovy Fishery ...Unpublished Ph.D dissertation.
Search M produces:
McEvoy, Arthur F., and Scheiber, Harry 1984 Scientists, entrepreneurs, and the policyprocess A study of the post-1945 California sardine depletion. McInnes, R1984 Anchovy management by quota. in EXPERT CONSULTATION ON THE REGULATION OF FISHING EFFORT (FISHING MORTALITY).
Search O produces:
Orbach, Michael K., and Cicin-Sain, Bilia 1984 Decision processes under the Magnuson Fishery Conservation andManagement Act: The case of the Northern Anchovy Fishery Management Plan.
Search S produces:
Scheiber, Harry N. 1986 Pacific ocean resources, science, and law of the sea: Wilbert M. Chapman and the Pacific fisheries
Search YZ produces:
Zuleta, Alejandro, and Serra, Juan R.1984 The management of Chilean pelagic fisheries with emphasis on the spanish sardine. in EXPERT CONSULTATION ON THE REGULATION OF FISHING EFFORT (FISHING MORTALITY).

WEBSITE CONTENT EVALUATION:

	Biology		Oceanography		Climate
	Industry		Research/Data	* * *	Publications
* *	Links		Images		Contacts

WEBSITE OVERVIEW:

This website is directly accessible. It provides access to a host of publications and works (such as the film included above). Follow the suggestions above to access the abstract for the nine matches found using the search engine. The results page provides an interactive link to the matches.

~~~~~~
~~~~~~

****

FISHERIES STATUS

These sites provide material pertaining to the state of fisheries in general with some reference to sardines, anchovy and pilchard fisheries. In conjunction with the previous websites, these sites may be useful for further INTERNET research.

****

GREENPEACE OCEAN CAMPAIGN

WEBSITE ADDRESS(ES):

(Multilateral and Bilateral Assistance for Fisheries Development in Less Developed Countries [GP])
http://www.greenpeace.org/home/gopher/campaigns/oceans/1991/fishdev.txt

WEBSITE CONTENT EVALUATION:

	Biology		Oceanography	Climate
* * *	Industry	* *	Research/Data	Publications
	Links		Images	Contacts

WEBSITE OVERVIEW:

This website is directly accessible. This forty-nine page website provides good information and data on the catches of several countries and aid provided to less developed countries (LDCs) to improve their fishing industry. Tables pertaining to the catches and size (in terms of vessels) of fleet illuminate the impact of the commerical fishing on the world's fisheries. Additionally, it includes a historical description of the world's fisheries leading to the current status. Reference to sardines and anchovies may be easily located ***by using the find button. Enter*** **(anch; *result*=13/sard; *reult*=4).** Finally, it includes a very useful glossary of terms pertaining to the fishing industry and economics.

~~~~~~
~~~~~~

HOW BOUNTIFUL ARE OCEAN FISHERIES?

WEBSITE ADDRESS(ES):

http://www.gcrio.org/CONSEQUENCES/winter96/oceanfish.html

WEBSITE CONTENT EVALUATION:

	Biology	* *	Oceanography		Climate
* * *	Industry	* *	Research/Data		Publications
* *	Links	* *	Images	*	Contacts

WEBSITE OVERVIEW:

This website is directly accessible. This eleven-page website provides very good background information regarding fisheries in general (including information pertaining to the geographic location of the world's fisheries, environmental impacts, economics (open access and sustainable yield). A table of select marine species from the Northwest Atlantic and Northeast Pacific provides information pertaining to the principal uses of these species. Several internal links provide access to cases such as The Case of the Orange Roughy and a chart of UNFAO data displaying landings of marine fish in millions of metric tons from 1975-1992. A link is also included to contact the author for further inquiry.

RELATED WEBSITE ADDRESS(ES):

(Home Page-The U.S. Global Change Resource Information Office [GCRIO])
http://gcrio.gcrio.org/
***select* (Search)**
http://gcrio.gcrio.org/searches/
***select a database to be queried; select* (AGCI Earth Pulse Notes);**
***click on* (Access Selected Database)**
http://gcrio.gcrio.org/cgi-bin/zgate
FOR EXAMPLE: *select* (AGCI EarthPulse Notes)
***set parameters for search; enter record containg* (ocean); *select default field*(anywhere in record)/*maintain default boolean operator* (AND)/ *enter second record containing* (fisheries); *select default field* (anywhere in record); *click on* (search)**
***Results*= 2 matches**
Reference 483-Primary production required to sustain global fisheries
Reference 754-The Management of fisheries and marine ecosystem

RELATED WEBSITE OVERVIEW:

This website is directly accessible. Follow the suggestions provided above for results in the other listed databases. A search string query provide an article summary , author or principal researcher, title of work and location.

~~~~~~

COASTAL PELAGICS SPECIES

WEBSITE ADDRESS(ES):

(Menu-Pacific Council)
http://www.pcouncil.org/menu.html
***select* (Coastal Pelagics)**
http://www.pcouncil.org/coastal.html
***select* (Coastal Pelagaic Species Advisory Subpanel and Coastal Pelagic Species Plan Development Team To Hold Meetings)**
http://www.pcouncil.org/cps398.html
***select* (Meeting Notice Coastal Species Plan Development Team)**
http://www.pcouncil.org/cpsnovdec.html

WEBSITE CONTENT EVALUATION:

	Biology	*	Oceanography		Climate
*	Industry		Research/Data		Publications
* *	Links		Images	* * *	Contacts

WEBSITE OVERVIEW:

This website is directly accessible. It provides an overview of the coastal pelagic fishes and the plan to manage these species. The introduction includes geographic, economic, and catch information. The other two website pages provide specific information about contacts and meetings. Interactive links provide easy access to these internal pages.

~~~~~~

PACIFIC FISHERIES RELATED LINKS

WEBSITE ADDRESS(ES):

(Links to Related Sites)
http://upwell.pfeg.noaa.gov/related_links.html

WEBSITE CONTENT EVALUATION:

	Biology	Oceanography	Climate
	Industry	Research/Data	Publications
* * *	Links	Images	Contacts

WEBSITE OVERVIEW:

This website is directly accessible by entering it into the web address line. It provides a sizeable list of interactive links to websites related to the Pacific Fisheries Envrionmental Laboratory, a research unit of The National Marine Fisheries Services Southwest Fisheries Science Center. The links are an extremely helpful aid in further research.

~~~~~~
~~~~~~

-CHAPTER 7-

****

CLIMATIC AND OCEANOGRAPHIC PROCESSES

These sites provide provide information on the oceanographic conditions in regions where the small pelagics are found. Additionally, these sites address potential impacts of climate change on fisheries and ocean processes. These sites do not necessarily contain material specifically related to sardines, anchovies and pilchards; but in conjunction with the sites found in the other chapters, they are useful for further INTERNET research.

****

U.S. GLOBEC REPORT SERIES:

EASTERN BOUNDARY CURRENT PROGRAM - REPORT ON CLIMATE CHANGE AND THE CALIFORNIA CURRENT ECOSYSTEM REPORT NO. 7

WEBSITE ADDRESS(ES):

http://www.usglobec.berkeley.edu/usglobec/Reports/reports.home.html
select **(Report #7 -- Eastern Boundary Current Program - Report on Climate Change and the California Current Ecosystem)**
http://www.usglobec.berkeley.edu/usglobec/Reports/ebcccs/ebcccs.contents.html
select **(Latitudinal Gradients Within the Eastern Boundary Current System from Working Group Reports)**
http://www.usglobec.berkeley.edu/usglobec/Reports/ebcccs/ebcccs.wg1.html
return to **(Report #7 -- Eastern Boundary Current Program - Report on Climate Change and the California Current Ecosystem)**
http://www.usglobec.berkeley.edu/usglobec/Reports/ebcccs/ebcccs.contents.html
select **(Importance of Mesoscale Physical Features to Ecological Processes in the California Current System from Working Group Reports)**
http://www.usglobec.berkeley.edu/usglobec/Reports/ebcccs/ebcccs.wg2.html
return to **(Report #7 -- Eastern Boundary Current Program - Report on Climate Change and the California Current Ecosystem)**
http://www.usglobec.berkeley.edu/usglobec/Reports/ebcccs/ebcccs.contents.html
select **(Paleo-oceanographic and Long-Term Historic Evidence of Past Variability from Working Group Reports)**
http://www.usglobec.berkeley.edu/usglobec/Reports/ebcccs/ebcccs.wg3.html
return to **(Report #7 -- Eastern Boundary Current Program - Report on Climate Change and the California Current Ecosystem)**
http://www.usglobec.berkeley.edu/usglobec/Reports/ebcccs/ebcccs.contents.html
select **(Nutrient Input Mechanisms in Eastern Boundary Current Regimes from Working Group Reports)**
http://www.usglobec.berkeley.edu/usglobec/Reports/ebcccs/ebcccs.wg4.html
return to **(Report #7 -- Eastern Boundary Current Program - Report on Climate Change and the California Current Ecosystem)**
http://www.usglobec.berkeley.edu/usglobec/Reports/ebcccs/ebcccs.contents.html
select **(El Niño/Southern Oscillation (ENSO) Effects Within the California Current System from Working Group Reports)**

http://www.usglobec.berkeley.edu/usglobec/Reports/ebcccs/ebcccs.wg5.html
return to **(Report #7 -- Eastern Boundary Current Program - Report on Climate Change and the California Current Ecosystem)**
http://www.usglobec.berkeley.edu/usglobec/Reports/ebcccs/ebcccs.contents.html
select **(Linkage of Observation Programs at Different Time and Space Scales from Working Group Reports)**
http://www.usglobec.berkeley.edu/usglobec/Reports/ebcccs/ebcccs.wg7.html
return to **(Report #7 -- Eastern Boundary Current Program - Report on Climate Change and the California Current Ecosystem)**
http://www.usglobec.berkeley.edu/usglobec/Reports/ebcccs/ebcccs.contents.html
select **(Major Shifts in Species Composition and Ecosystem Structure from Working Group Reports)**
http://www.usglobec.berkeley.edu/usglobec/Reports/ebcccs/ebcccs.wg8.html

WEBSITE CONTENT EVALUATION:

	Biology	* * *	Oceanography	* *	Climate
	Industry	* * *	Research/Data	*	Publications
*	Links	* * *	Images	*	Contacts

WEBSITE OVERVIEW:

These websites are easily accessible by following the navigation paths described above. The pages are part of a series of U.S. Globec Reports which pertain to ocean ecosystems. This particular report, Report Number 7, Eastern Boundary Current Program Report on Climate Change and the California Current Ecosystem including a very good section entitled Working Group Reports. Within the Working Group Reports, the website pages listed above provide very good general information about the Eastern Boundary Coastal Systems. They include information regarding the dynamics of the EBCS, ecological processes, El Nino/Southern Oscillation and species composition of the ecosystem.

Each page highlighted above provides very good text information and most include very good binary colored charts and graphs. Some provide information or references to Sardines and Anchovies:

The page titled Latitudinal Gradients Within the Eastern Boundary Current System provides good information on the California Current System (CCS), including the dynamics of the current system , i.e. wind stress, upwelling, coastal morphology and influence of long-time-scale advection and primary/secondary production in the current system. It also provides information pertaining to eggs, larvae and spawning of species, including sardine and anchovy.

The page titled Paleo-oceanographic and Long-Term Historic Evidence of Past Variability provides good initial information regarding the CCS with regards to the impacts of climate and anthropocentric changes on the current system. Additionally, the long-term variability in the CCS as an ecosystem is reviewed from the perspective of paleo-

oceanographic data. Part of the data collected involves sedimentary remains of sardines and anchovies. This is well displayed through several very good graphs:

1. histories of coastal pelagic fish populations from anaerobic depositional environments
2. 1650-year proxy time series of biomass estimates for Pacific sardine and northern anchovy off California

A SCIENCE PLAN FOR THE CALIFORNIA CURRENT U.S. GLOBEC REPORT N0. 11

WEBSITE ADDRESS(ES):

(U.S. Globec Report Series)
http://www.usglobec.berkeley.edu/usglobec/Reports/reports.home.html
***select* (A Science Plan For The California Current U.S. Globec Report No. 11)**
http://www.usglobec.berkeley.edu/usglobec/Reports/ebcip.contents.html
***return to* (U.S. Globec Report Series)**
http://www.usglobec.berkeley.edu/usglobec/Reports/reports.home.html
***select* (Section II-Introduction)**
http://www.usglobec.berkeley.edu/usglobec/Reports/ebcip.intro.html
***return to* (U.S. Globec Report Series)**
http://www.usglobec.berkeley.edu/usglobec/Reports/reports.home.html
***select* (Section III-Oceanograpghic Setting)**
***select* (The Physical Setting)**
http://www.usglobec.berkeley.edu/usglobec/Reports/ebcip.physetting.html
***return to* (Section III-Oceanograpghic Setting)**
***select* (The Biological Setting)**
http://www.usglobec.berkeley.edu/usglobec/Reports/ebcip.biosetting.html
***return to* (U.S. Globec Report Series)**
http://www.usglobec.berkeley.edu/usglobec/Reports/reports.home.html
***select* (Section IV-The Climate Context)**
http://www.usglobec.berkeley.edu/usglobec/Reports/ebcip.climcontext.html
***return to* (U.S. Globec Report Series)**
http://www.usglobec.berkeley.edu/usglobec/Reports/reports.home.html
***select* (Section VIII-Oceanographic Background)**
***select* (Historical Variability in the CCS)**
http://www.usglobec.berkeley.edu/usglobec/Reports/ebcip.histovar.html
***return to* (Section VIII-Oceanographic Background)**
***select* (Global Eastern Boundary Currents)**
http://www.usglobec.berkeley.edu/usglobec/Reports/ebcip.globecs.html

WEBSITE CONTENT EVALUATION:

* * *	Biology	* * *	Oceanography	* * *	Climate
	Industry	* * *	Research/Data	* *	Publications
*	Links	* *	Images	* * *	Contacts

WEBSITE OVERVIEW:

These pages are easily accessible by following the navigation paths described above. The listed pages are part of a series of U.S. Globec Reports on ocean ecosystems. This website is part of a larger homepage maintained by U.S. GLOBEC. U.S. GLOBEC (Global ocean Ecosystems dynamics) is a research program organized by oceanographers and fisheries scientists to address the question of how global climate change may affect the abundance and production of animals in the sea.

These pages provide invaluable information pertaining to atmospheric and ocean systems which influence the California Coastal Current System (CCCS), population dynamics of selected target species and the importance of fishing industry in the (CCCS) system. Sardine and anchovies are mentioned throughout the web pages. Topics pertaining to genetic variability of fish populations and use of satelitte imagery are included in these pages.

Each set of website pages includes very detailed information pertaining to each heading, i.e. Climate Context includes details involving gradual CO2 doubling which causes temperatures in the mid-latitudes to increase by 2 ^{o}C at the surface. Each section provides excellent detailed material and graphics.

RELATED WEBSITE ADDRESS(ES):

http://www.usglobec.berkeley.edu/usglobec/news/news5/news5.sarp.html
http://www.usglobec.berkeley.edu/usglobec/news/news9/news9.cccc.html
http://www.usglobec.berkeley.edu/usglobec/brochure/baumgartner.html
http://www.usglobec.berkeley.edu/usglobec/brochure/west.coast.html
http://www.usglobec.berkeley.edu/usglobec/brochure/kawaski.html
http://www.usglobec.berkeley.edu/usglobec/minutes/SSC.apr97.mins.html
http://www.usglobec.berkeley.edu/usglobec/minutes/SSC.oct94.mins.html

RELATED WEBSITE OVERVIEW:

Although these website addresses provide some additional information pertaining to sardines and anchovies, most of these websites address broad topics such as Carrying Capacity of the ocean.

~~~~~~

PICES GLOBEC REPORTS FOR CLIMATE CHANGE AND CARRYING CAPACITY (CCCC)

WEBSITE ADDRESS(ES):

(PICES Climate Change and Carrying Capacity Index)
http://pices.ios.bc.ca/cccc/
***select* (CCCC-Sub Directory)**
http://pices.ios.bc.ca/cccc/cccc/
***select* (CCCC94.HTM)**
http://pices.ios.bc.ca/cccc/cccc/CCCC94.HTM
use the find button; enter* (anch; *result*= 3 matches/pelagic; *r
***result*=9matches/sard; *result*=10 matches)**
~~~~~~

return to **(CCCC-Sub Directory)**
http://pices.ios.bc.ca/cccc/cccc/
select **(cccc96.htm -PICES Scientific Report No. 7 1997)**
http://pices.ios.bc.ca/cccc/cccc/cccc96.htm
use the find button; enter **(anch; *result*= 0 matches/pelagic; *result*= 8 matches/sard; *result*=4 matches)**

WEBSITE CONTENT EVALUATION:

	Biology	* *	Oceanography	* *	Climate
	Industry	* * *	Research/Data	* *	Publications
* *	Links		Images	*	Contacts

WEBSITE OVERVIEW:

These websites are directly accessible by entering each into the web address line or by following the navigation paths described above. The website pertaining to the 1994 Report of the PICES-GLOBEC International Program on Climate Change and Carrying Capacity is 11 pages and contains information about a new international science program in the North Pacific. This report describes climate and carrying capacity nexus for the temperate and sub-artic regions of the North Pacific. ***Follow the suggestions above for specific references to anchovies, sardines and pelagic fishes***. The second website pertaining to the PICES Scientific Report No. 7 (1997) is 58 pages long and contains extensive information pertaining to modeling of select components of climate change and their impact on carrying capacity of the ocean ecosystems. ***Follow the suggestions above for specific references to anchovies, sardines and pelagic fishes.*** Additionally, both of these pages provide internal links for aiding navigation between the pages of the website.

RELATED WEBSITE ADDRESS(ES):

(PICES Science Commitee Index)
http://pices.ios.bc.ca/comm/
select **(FIS-Index Comm/Fis)**
http://pices.ios.bc.ca/comm/fis/
select **(FIS94.HTM-1994 Report on Fishery Science Committee)**
http://pices.ios.bc.ca/comm/fis/FIS94.HTM
use the find button; enter **(anch: *result*=2 matches; sard: *result*=7 matches; pelagic: *result*=4 matches)**

RELATED WEBSITE OVERVIEW:

This website is directly accessible by entering it into the web address line or by following the navigation paths described above. It provides information pertaining to the 1994 Report of the Fishery Science Committee. Additionally, references are provided for further research. Internal links aid in navigation between the website pages.

~~~~~~
~~~~~~

PFEG COASTAL UPWELLING INDICES

WEBSITE ADDRESS(ES):

http://www.pfeg.noaa.gov/products/upwell.html

WEBSITE CONTENT EVALUATION:

	Biology	*	Oceanography		Climate
	Industry	*	Research/Data		Publications
*	Links	*	Images		Contacts

WEBSITE OVERVIEW:

This website is directly accessible by entering it into the web address line. It provides general information regarding coastal upwelling zones. The indices are calcualted based upon Ekman's theory. Several interactive links are included for further research.

~~~~~~

GLOBAL VERSUS LOCAL CHANGES IN UPWELLING SYSTEMS

WEBSITE ADDRESS(ES):

(CEOS Index)
http://www.pfeg.noaa.gov/CEOS/
***select* (CEOS Volume TOC.html)**
http://www.pfeg.noaa.gov/CEOS/CEOS_Volume_TOC.html
***return to* (CEOS Index)**
http://www.pfeg.noaa.gov/CEOS/
***select* (CEOS Volume Intro.html)**
http://www.pfeg.noaa.gov/CEOS/CEOS_Volume_Intro.html

WEBSITE CONTENT EVALUATION:

* *	Biology	* * *	Oceanography	*	Climate
*	Industry	*	Research/Data		Publications
* *	Links		Images		Contacts
~~~~~~

WEBSITE OVERVIEW:

These websites are accessible by following the navigation paths described above. They provide a table of contents and introduction to the publication Global Versus Local Changes In Upwelling Systems. The introduction provides background information, goals and objectives of the CESOS Project including references. The table of contents contatins thirty-three chapters including the title and author(s) of each. In the table of contents page, ***use the find button, enter*** **(anch:*result*=1 match; pelagic:*result*=5 matches; sard:*result* 5 matches)**. ****Note that the page is in wide (laytout) format. Scroll to the right to view matches not immediately visible on monitor screen.*** Additionally, the page provides good internal links for easy navigation within the website.

~~~~~~

CALIFORNIA'S OCEAN RESOURCES: AN AGENDA FOR THE FUTURE

WEBSITE ADDRESS(ES):

(Index)
http://ceres.ca.gov/cra/ocean/html
select **(Chapter 4: California's Ocean Ecosystem)**
http://ceres.ca.gov/cra/ocean/html/chapt_4.html

return to **(Index)**
select **(Chapter 5A: Habitats and Living Resoucres)**
http://ceres.ca.gov/cra/ocean/html/chapt_5a.html

WEBSITE CONTENT EVALUATION:

	Biology	* * *	Oceanography		Climate
	Industry	*	Research/Data		Publications
* *	Links	* * *	Images		Contacts

WEBSITE OVERVIEW:

These website are accessible by following the navigation paths described above. They pages are selected chapters from the publication, California's Ocean Resources: An Agenda for the Future. Chapter 4, which provides good details describing the habitats of the Califonia Coastal Ecosystems, defines the California Coastal Zone into four zones, inland watershed, enclosed water, nearshore ocean and offshore ocean. Chapter 5A provides good material regrading the general fishery stocks of the Califonia Coastal Ecosystems; several sections, from 5A-5 to 5A-8; make reference to anchovy and California sardine. There very useful map of the four coastal zones in Chapter 4, and good interactive links back to the homepage aid navigation.

~~~~~~

DECADAL SCALE VARIABILITY AND ECOSYSTEM RESPONSES

WEBSITE ADDRESS(ES):

(Index)
http://www.iphc.washington.edu/PAGES/IPHC/Staff/hare/html/decadal/decadal.html
select **(Biota of the North Pacific)**
http://www.iphc.washington.edu/PAGES/IPHC/Staff/hare/html/decadal/biota/biota.html

WEBSITE CONTENT EVALUATION:

*	Biology	* * *	Oceanography	* * *	Climate
	Industry		Research/Data		Publications
* * *	Links	* * *	Images	*	Contacts

WEBSITE OVERVIEW:

These websites are accessible by following the navigation paths described above. The biota page provides very good multi-colored charts and images pertaining to several marine species (not including anchovies or sardines) as well as to oceanic and climatic processes in the North Pacific. The page provides several very good links to a host of internal resources concerning climate, oceanography, and biota.

RELATED WEBSITE ADDRESS(ES):

Front Door for Steven Hare's Web Home
http://www.iphc.washington.edu/PAGES/IPHC/Staff/hare/hare.htm

RELATED WEBSITE OVERVIEW:

This page is directly accessible by entering into the web address line. It provides access to a host of resources regarding the environment with particular focus on oceanic and climatic processes. ***Select*** **Journals or Publications, Manuscripts and Presentations** to access several pages of interactive links to a variety of literary works and publication homepages on oceans, climate and fishereies.

~~~~~~
~~~~~~

CLIMATE CHANGE AND OCEAN PROCESSES: WHAT ARE THE CONSEQUENCES?

WEBSITE ADDRESS(ES):
http://www.monterey.edu/faculty/SharpGary/world/ClimateChange%26Ocean.html

WEBSITE CONTENT EVALUATION:

* * *	Biology	* * *	Oceanography	* * *	Climate
*	Industry	* *	Research/Data	* * *	Publications
* * *	Links	* * *	Images	* *	Contacts

WEBSITE OVERVIEW:
This site is directly accessible by entering it into the web address line. This 41 page site provides information found in a report presented at Texas A&M University, Galveston. It includes very good information about the oceanic, climatic and biological realms effect the sardine and anchovy fisheries. Good links authors and select topics provide an avenue for additional research. Very good images are included with detailed description within the work. In particular, Figure 12 displays catch statistics of three isolated *Sardinops ssp* in relation to region-wide boom-bust processes. Additionally, an extensive reference section aids in further research. ***To locate the sections directly related to sardines, anchovies and pelagic fishes, use the find button, enter* (anch: *result*=6 matches; pelagic; *reult*=17 matches; sard: *result*=24 matches).**

~~~~~~

CLASSIC COASTAL ZONE CURRENT SYSTEMS (CZCS) SCENES

WEBSITE ADDRESS(ES):
(Index)
http://daac.gsfc.nasa.gov/CAMPAIGN_DOCS/OCDST/classic_scenes/00_classics_index.html
***select* (Chapter 1: Tasmania [Interactions of ocean currents and biology])**
http://daac.gsfc.nasa.gov/CAMPAIGN_DOCS/OCDST/classic_scenes/01_classics_tasmania.html

***return to* (Index)**
http://daac.gsfc.nasa.gov/CAMPAIGN_DOCS/OCDST/classic_scenes/00_classics_index.html
***select* (Chapter 2: Southwest Africa [The Benguela Upwelling Zone])**
http://daac.gsfc.nasa.gov/CAMPAIGN_DOCS/OCDST/classic_scenes/02_classics_benguela.html

***return to* (Index)**
http://daac.gsfc.nasa.gov/CAMPAIGN_DOCS/OCDST/classic_scenes/00_classics
~~~~~~

_index.html
***select* (Chapter 9: Agulhas Current [The Agulhas Retroflection])**
http://daac.gsfc.nasa.gov/CAMPAIGN_DOCS/OCDST/classic_scenes/09_classics_agulhas.html

***return to* (Index)**
http://daac.gsfc.nasa.gov/CAMPAIGN_DOCS/OCDST/classic_scenes/00_classics_index.html
***select* (References)**
http://daac.gsfc.nasa.gov/CAMPAIGN_DOCS/OCDST/classic_scenes/10_classics_references.html

WEBSITE CONTENT EVALUATION:

*	Biology	* * *	Oceanography		Climate
	Industry	* *	Research/Data	* *	Publications
* * *	Links	* * *	Images	* *	Contacts

WEBSITE OVERVIEW:

These pages are accessible by following the navigation paths described above. Although 12 chapters are included in this site,the three chapters shown above most closely related to the habitats and currents of importance to the sardine and anchovy fisheries. Each chapter contains multi-colored images of the Coastal Zone Current System (CZCS), a brief text description of each CZCS image, and contacts including e-mail addresses for further inquiry. Chapter 2 includes good schematics of the oceanic processes as well. Additionally, a global map displays the location of each scene (Chapters 1-12) for easy geographic reference.

~~~~~~

SEASONAL VARIABILITY IN THE AGULHAS REGION: RESULTS FROM ALTIMETRY, MODELS AND AVHRR

WEBSITE ADDRESS(ES):

http://www.soc.soton.ac.uk/JRD/SAT/RSADU/Agul.html

WEBSITE CONTENT EVALUATION:

	Biology	* * *	Oceanography		Climate
	Industry	* * *	Research/Data	*	Publications
* *	Links	* * *	Images	*	Contacts
~~~~~~

WEBSITE OVERVIEW:

This site is directly accessible by entering it into the web address line. It presents a study of the variability of the Agulhas Current utilizing satelitte data and models. The page includes multi-colored images of the current. It also provides information pertaining to the published work and an interactive link back to the home page (where the e-mail address of the principal researcher is located).

~~~~~~

COLOUR FIGURES FOR: REGIONAL OCEANOGRAPHY: AN INTRODUCTION

WEBSITE ADDRESS(ES):

(Index)
http://gaea.es.flinders.edu.au/~mattom/regoc/figlist.html
select **(Figure 8.6-Pacific Ocean Currents)**
http://gaea.es.flinders.edu.au/~mattom/regoc/text/8circ.html
return to **(Index)**
http://gaea.es.flinders.edu.au/~mattom/regoc/figlist.html
select **(Figure 11.6-Indian Ocean Currents)**
http://gaea.es.flinders.edu.au/~mattom/regoc/text/11circ.html
return to **(Index)**
http://gaea.es.flinders.edu.au/~mattom/regoc/figlist.html
select **(Figure 14.16-The Benguela Current Upwelling System)**
http://gaea.es.flinders.edu.au/~mattom/regoc/text/14Bupw.html
return to **(Index)**
http://gaea.es.flinders.edu.au/~mattom/regoc/figlist.html
select **(Figure 14.17-Coastal Upwelling in the Canary Current)**
http://gaea.es.flinders.edu.au/~mattom/regoc/text/14Cupw.html
return to **(Index)**
http://gaea.es.flinders.edu.au/~mattom/regoc/figlist.html
select **(Figure 14.2-Atlantic Ocean)**
http://gaea.es.flinders.edu.au/~mattom/regoc/text/14circ.html
return to **(Index)**
http://gaea.es.flinders.edu.au/~mattom/regoc/figlist.html
select **(Figure 14.7-The Gulf Steam)**
http://gaea.es.flinders.edu.au/~mattom/regoc/text/14Gulf.html

WEBSITE CONTENT EVALUATION:

	Biology	* * *	Oceanography		Climate
	Industry		Research/Data	* *	Publications
* * *	Links	* * *	Images	* *	Contacts
~~~~~~

WEBSITE OVERVIEW:

This website is found by following the navigation paths described above. The pages posted above provide multi-colored figures of the specified currents and oceans; these figures are part of the publication: Regional Oceanography: An Introduction; the index contains more details about the publication. Each page contains interactive links back to the index; and e-mail to contact the principal researcher.

~~~~~~

CTWW: SOUTHERN AFRICAN SEASONAL OUTLOOK

WEBSITE ADDRESS(ES):

http://weather.iafrica.com/forecasts/cip_seasonal_outlook.html

WEBSITE CONTENT EVALUATION:

	Biology	* * *	Oceanography	* * *	Climate
* *	Industry		Research/Data		Publications
	Links		Images	* *	Contacts

WEBSITE OVERVIEW:

This website is directly accessible by entering it into the web address line. It provides a seasonal outlook and the impacts of the seasonal weather on Southern Africa, including Fisheries Impacts (eg. During the El Nino of 1997-98, anchovy and pilchard catches were down 21% & 75% respectively; fish oil yield dropped by 42%). This page is updated by monthly. Additionally, it contains contact information and interactive e-mail addresses.

~~~~~~

KUROSHIO EDGE EXCHANGE PROCESSES: RECENT FINDINGS

WEBSITE ADDRESS(ES):

(Index)
http://sun.gcc.ntu.edu.tw/IGBP/1996_IGBP/sec3-3/3-3.html
***select* (3.3.1-Hydrography and Nutrient Dynamics)**
http://sun.gcc.ntu.edu.tw/IGBP/1996_IGBP/sec3-3/3-3-1.html
***return to* (Index)**
http://sun.gcc.ntu.edu.tw/IGBP/1996_IGBP/sec3-3/3-3.html
***select* (3.3.4-Trophic Dynamics and Fisheries)**
http://sun.gcc.ntu.edu.tw/IGBP/1996_IGBP/sec3-3/3-3-4.html
***return to* (Index)**
http://sun.gcc.ntu.edu.tw/IGBP/1996_IGBP/sec3-3/3-3.html
***select* (References)**
http://sun.gcc.ntu.edu.tw/IGBP/1996_IGBP/sec3-3/refer.html

WEBSITE CONTENT EVALUATION:

* *	Biology	* * *	Oceanography		Climate
	Industry	* * *	Research/Data	* * *	Publications
*	Links		Images		Contacts

WEBSITE OVERVIEW:

This website is found by following the navigation paths described above. These pages provide information about the Kuroshio Current and the fisheries of the North Western Pacific Ocean, including the Japanese anchovy, *Engraulis japonicus*. The index page includes interactive links to each subsection. An extensive reference page is included for further research.

D/X0653E/1500